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Table of Contents.

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ORIGINAL ARTICLES—	Page.	ABSTRACTS FROM MEDICAL LITERATURE—	Page.
Intestinal Intubation, by John Devine, M.S., F.R.A.C.S.	213	Bacteriology and Immunology	230
A Further Report on the Treatment at the Children's Hospital, Melbourne, of Influenzal Meningitis with Sulphonamides and Type-Specific Serum, by Elizabeth K. Turner, M.B., B.S.	219	Hygiene	230
"Found Dead", "Dead in Bed", and "Collapsed and Died", by J. B. Cleland	221	BRITISH MEDICAL ASSOCIATION NEWS—	
Hemiplegia of the Thyroid Gland, by Hugh R. G. Poate and S. L. Spencer	223	Scientific	232
REPORTS OF CASES—		Medico-Political	233
A Case of Chronic Solid Subdural Hæmatoma, by R. A. Money	224	MEDICAL SOCIETIES—	
REVIEWS—		Melbourne Pædiatric Society	233
Syphilis	226	Tasmanian Association of Scientific Societies	235
Disease in Many Tongues	226	CORRESPONDENCE—	
LEADING ARTICLES—		Immunization against Diphtheria and Pertussis	235
The Health of Great Britain	227	Chronic Appendicitis	236
CURRENT COMMENT—		Sociological Medicine	236
Fibrositis of the Back	229	Pharmaceutical Benefits Act, 1944	237
Index to "The Medical Journal of Australia"	229	The Annual Report of the Queensland Branch	238
		Public Health Administration in Western Australia	239
		NAVAL, MILITARY AND AIR FORCE—	
		Appointments	240
		NOMINATIONS AND ELECTIONS	240
		DIARY FOR THE MONTH	240
		MEDICAL APPOINTMENTS; IMPORTANT NOTICE	240
		EDITORIAL NOTICES	240

INTESTINAL INTUBATION.

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INTESTINAL INTUBATION, clinically applied by Miller and Abbott, has been instrumental in reducing the mortality of intestinal obstruction, paralytic ileus and peritonitis, and in making much easier many other surgical procedures on the intestines. The procedure is not without difficulties and dangers, but these may be minimized by attention to detail in technique. In this article, the technique of passage of the tube, and the results to be expected from its successful passage, are discussed, and the points are illustrated by clinical histories.

Description of the Tube.

The tube commercially available in this country is eleven feet in length and has a metal perforated tip, and just behind this the balloon is tied on (Figure I). The balloon most commonly employed holds about 50 cubic centimetres of air, and is inflated through a fine inner lumen of the tube which communicates with the interior of the balloon by a number of holes. Balloons are usually made from condoms. In one type of tube in use there are no aspirating holes behind the balloon, but in a more recent type available here there are also suction ports behind the balloon—an advantage, since this is a means of getting rid of secretions and unabsorbed fluids from above the balloon without either deflating it or withdrawing the tube at intervals. The tube is marked at 45, 60 and 75 centimetres from the tip, and from then on in feet. The end opposite the tip has a metal fitting, one metal tube being marked "suction" and serving the main aspirating lumen of the tube, and the other metal tube being unmarked and serving the fine inner lumen through which the balloon is inflated.

Preparation of the Tube.

The first stage of any method of introduction is the preparation of the tube. Careful preparation of the tube will avoid the difficulties and dangers of its use, and should not be delegated to another but performed by the introducer himself. Thus he may know that when he goes to remove the tube he has been able to withdraw all the air, and that careless tying-on of the balloon has not interfered with the lumen of the inner tube which inflates it (see Figure I). Neglect of this precaution may necessitate the patient's undergoing a laparotomy for removal of the tube, or intussusception may result if withdrawal is persisted with. The bag, which has been carefully tied on with silk, is tested for leakage by inflating it with air, and then, most important of all, the volume it will take is noted. A new bag is used every time the tube is introduced. The aspirating lumen is tested for patency, and any blocked holes in the metal tip are opened with a pin.

Before the tube is introduced, a suction apparatus and a balloon inflation apparatus are attached. For balloon inflation it is convenient to have a 50 cubic centimetre dry graduated "Record" syringe, and air is the usual medium used for inflation, though water at times is useful. A suitable form of suction apparatus for use with the Miller-Abbott tube is that designed by Wangenstein (Figure II). This apparatus has many advantages and is simple and readily improvisable. Too strong a suction tends to force small pieces of food matter firmly into the holes at the end of the tube, and to keep it blocked. With suction employed by other mechanical means (unless a trap is used), negative pressure tends to build up if the tube lumen blocks, and the blockage then becomes difficult to remove. Suction by Wangenstein's method is never strong. Another advantage of the Wangenstein form of suction is that water flows from the upper to the lower tube only when suction is actually occurring, and when the bowel lumen is empty no suction occurs. Thus, the amount of gas evacuated can be estimated by measuring the amount of water that flows from the top bottle to the bucket.

Introduction of the Tube.

There are many methods for inducing the tube to pass the watershed point of the mid-duodenum. The first method here described has been found satisfactory in practice in many cases, but it must be emphasized that if one method fails another must be tried. In cases of urgency the surest method is to use a stilette with or without manipulation under the X-ray screen. However, in some cases of obstruction, the stomach must be aspirated for some hours before sufficient motility returns to carry the tube out of the stomach.



FIGURE I.

The Miller-Abbott tube. A: suction metal tip; B: distal tie holding rubber inflatable balloon in place; C: soft rubber balloon; D: proximal tie holding rubber balloon in place; too great pressure on this tie will obstruct the lumen to inflate the balloon; E: connexion through which the balloon is inflated; F: connexion through which suction is maintained.

When used without a stilette the tube is well greased with glycerine, and introduced into the nostril, the bag being completely deflated. It is usually well tolerated in the nostril, and there is seldom any necessity to anaesthetize the nostril with cocaine, as is sometimes done. If this is necessary, the nostril is sprayed with a little 2% "Decalin" solution. The patient is given a sip of milk while the tube is rapidly run down the oesophagus. Milk is used because (i) it can be recognized when it is sucked out, (ii) it appeals to patients who are vomiting and dehydrated, and (iii) it has some lubricating effect. There

and no "spring-back" of the plunger of the syringe which introduces the air, or no stimulated contraction to force the plunger back (the "feel" of the plunger of the inflating syringe takes a little while to acquire). If a recording instrument is used (the writer uses a converted Mackenzie polygraph), the presence of the tip of the tube in the fundus of the stomach is recognized by the fact that only respiratory waves of compression of the balloon are recorded, peristaltic compression waves being absent. The litmus test of the reaction of the aspirated contents is not very helpful since, particularly in the presence of obstruction, the intestinal contents may give an acid reaction far down the bowel.

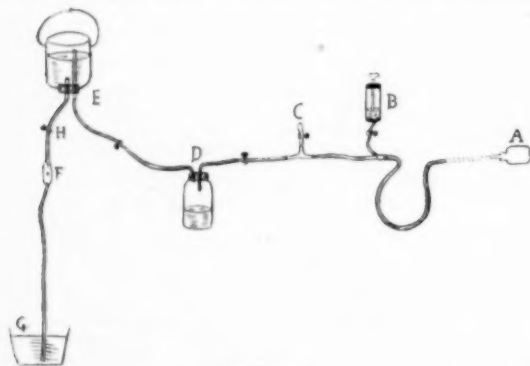


FIGURE II.

Convenient arrangement of apparatus for intestinal intubation. A: balloon and tip of tube; B: dry syringe for inflating the balloon; C: side connexion with clip through which the tube-aspirating lumen can be cleared when blocked, and through which nutrient fluids can be introduced when so desired; D: bottle to collect the fluid aspirated; E: inverted bottle containing ordinary tap water; F: Murphy's dropper (the fluid from bottle E flows through the dripper to the bucket G, and so creates the suction); G: bucket to collect water from bottle E; H: clips on the rubber tubing; clips on either side of bottles E and D enable them to be isolated from the system and emptied or filled.

is sometimes a slight delay at the cardiac orifice, but as soon as this has been passed further sips of milk are given while the well-lubricated tube is rapidly run down the "Magenstrasse" (Figure III). This passage along the lesser curvature is physiologically the only part opened up when liquids are drunk and the stomach is empty. Fluids drunk pass through the channel along the lesser curvature straight into the pyloric part of the stomach. Thus the sipping of reasonable quantities of milk or water usually ensures a safe passage of the tube into the pyloric part of the stomach. At this stage suction is commenced

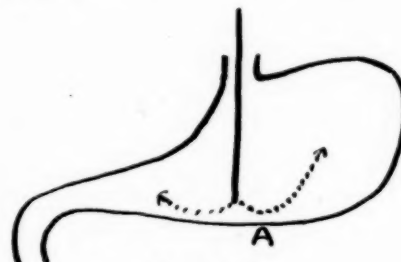


FIGURE III.

The Miller-Abbott tube can be seen under the X-ray screen to impinge on the stomach wall at about A. If there is fluid in the stomach it floats (because of its air content) upwards towards the fundus. The left-hand dotted line shows the desirable course towards the pylorus.

Stage two of the introduction of the tube consists in getting it past the mid-duodenum, the "intestinal watershed". After a slight pause of a few minutes to empty the stomach by aspiration, further sips of milk are given; but the tube is not permitted to advance further, so this procedure results in the straightening out of any kinks or coils that may have occurred in the stomach. Then, still with the balloon uninflated, further mouthfuls of milk are given at the same time as the tube is rapidly advanced a foot or so. Usually the aspiration bottle then shows that pure bile is being aspirated. If the tube passes the mid-duodenum successfully, intestinal contents, which may be faeculent in the case of an obstruction or thin, fluid and bile-stained if no obstruction is present, are aspirated. (In many cases, however, gastric and intestinal contents are indistinguishable.) Then, and only then, if the mid-duodenum has been passed, is the tube inflated.

The mid-duodenum is the dividing range in the intestinal watershed. Soft material, such as the inflated balloon,

above this area tends to be vomited, and below this area tends to pass down.

Inflation of the balloon in the duodenum gives a feeling of resistance to the inflating syringe, but there is no swing-back of the syringe plunger or movement of the plunger indicating peristaltic movement. Recording devices sometimes show a number of small waves and slight respiratory movements.

The fact that the tube is in the jejunum can be recognized by the following observations. (i) Pure bile is no longer aspirated, but instead bile-stained characteristic intestinal contents are aspirated, containing either recognizable food fragments or, in acute obstruction, faeculent fluid. (ii) When the balloon is inflated, the inflating syringe plunger gives a distinct spring-back due to contraction stimulated by the distension of the balloon, peristaltic contractions cause movements of the plunger at intervals, and recording instruments show the intermittent contractions of peristaltic waves. (iii) Milk given by mouth is not aspirated immediately, or after a short interval, but only after a long interval. (iv) If peristalsis is strong, gentle traction on the tube as it enters the nose may disclose its presence by conduction along the tube. (v) X-ray examination shows that the tube has left the stomach. This may be confirmed by the introduction of a little thin barium solution through the aspirating lumen.

The inflated bag is carried on down through the intestine, because the intestine considers it to be a bolus of food, and because as it passes down it sucks out fluid and gas from the segment immediately in front of it. The fluid aspirated is measured by the contents of the aspiration bottle, and the volume of gas aspirated by the volume of water that flows from the top to the bottom bottle (where the Wangenstein method of suction is employed). In the upper part of the small intestine the "peristaltic grip" on the tube is not sufficient for the balloon to pull in the rubber tubing through the nose against the resistance of friction in the duodenum, stomach and oesophagus. Therefore, it is kept well greased with glycerine and for a start is helped down through the nose by sips of fluid and gentle pressure at the rate of about six inches an hour. If the tube is kept well lubricated it will pull itself in through the nose after five or six feet have been passed.

There are only eleven feet of length in the usual tube, yet it often reaches the caecum and occasionally passes out the anus. This passage of the tube far beyond its own length is attained by an action of threading the intestine on itself, in the same way as pyjamas are threaded on a pyjama cord by means of a pin. The average time of passage of the tube through to the lower part of the ileum is twelve to eighteen hours. This is much longer than is required for the passage of a bolus of food to this area; but in the case of the tube there is considerable resistance to passage, since the balloon has to drag a long tube round a series of bends. At the lower part of the ileum the tube usually pauses for a considerable time, and it is only in a certain percentage of cases that it will enter the caecum.

Alternative Methods of Introduction of the Tube.

Besides the foregoing method of introducing the tube past the duodenum there are many other methods in use, and failure to pass the tube by one method may necessitate the employment of one or other of the remaining methods. The principles underlying the methods used to pass the tube through the pylorus are simple (Figures III, IV and V).

In the first method described here use is made of the fact that fluid taken into an empty stomach follows a short course along the lesser curvature and does not open up the cardia or greater curvature.

In the method in which air is used, the stomach is blown up so that the *sphincter antri* is relaxed and the tube, which is heavier than air but lighter than water (even when deflated), falls by posture into the pyloric antrum.

Another method I have tried is to place the patient on the left side, and with his stomach full of water, to float up the partially inflated balloon into the pyloric antrum and keep it there by sucking the stomach dry. The patient is then turned on to his back and the balloon is deflated.

The method described by Abbott makes use of air to relax the prominent *sphincter antri*, which bars the passage of the tube into the pylorus when the stomach is empty. (This muscle is consistently seen during gastroscopy, appearing like a rope tied round the prepyloric area, and is noted to relax when the stomach is inflated with air.) In this method the tube is introduced to the 60 centimetre mark, and then 300 cubic centimetres of air are introduced through the aspirating lumen and the patient is



FIGURE IV.
If the stomach is fairly empty it may be possible to rush the tube (with fluid taken by mouth) along the lesser curvature in the "Magenstrasse".

placed on his right side. The tube is next slowly introduced through the inflated stomach to the 75 centimetre mark, when it ought to be lying in the pylorus. Next the stomach is aspirated of its air, and as it contracts after this deflation, it drives the tube through the duodenum past the critical watershed point, and the balloon can then be blown up and will pass down and not up.



FIGURE V.
When the stomach is inflated with air, the heavier-than-air tube has been dropped by gravity (with the patient postured on the right side) past the distended *sphincter antri* (B). The arrow shows the direction of the force applied to the tube when the stomach is later deflated.

A variation of the foregoing method as described by Abbott is to use a stilette in the tube. A 0.016 inch stainless steel wire is passed through the aspirating lumen from six inches from the tip and brought out through the rubber tubing at the two-foot mark. This stiffens the tube, and when it is introduced to the 60 centimetre mark and the stomach is inflated, subsequent deflation at the 75 centimetre mark is more likely to drive the stiffened tube through the pylorus, and in addition manipulation under the fluoroscope when required is made easier. Personal experience of this method seems to suggest that it is one of the most certain, but it involves puncturing the tube, and the stilettes used are difficult to manage.

In yet another method the tube is introduced to the 60 centimetre mark without suction, and then, with the patient

drinking at frequent intervals, the tube is introduced for an inch every ten minutes until the 75 centimetre mark is reached. This method has the disadvantage that if the patient has an obstruction and is vomiting, the additional water which must be taken and which is not immediately aspirated causes further upset.

Still another and very sure method is to manipulate the tube through the pylorus by direct manual manipulation under the fluoroscopic screen. This method, while being sure, has several disadvantages. Firstly, most of the patients are too ill to be taken to the X-ray department for fluoroscopy, and often too ill for fluoroscopic examination in the vertical position; moreover, manipulation is very difficult in the case of distended patients. Fluoroscopic examination in the patient's bed with a portable X-ray machine is not practicable, because of the difficulty of placing the patient in a suitable position and of obtaining sufficient penetration of the rays for a sufficiently long time for the manipulation to be carried out. A further disadvantage of this method is that, since high milliamperage must be used, the operator's hands are exposed for a

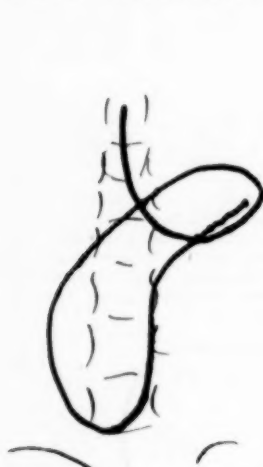


FIGURE VI.
Tracing of an X-ray photograph which shows a tube coiled in the stomach.

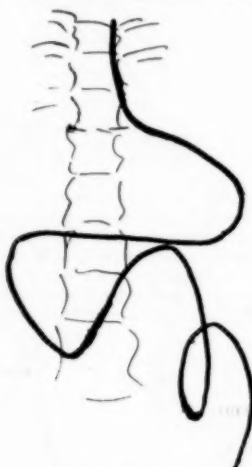


FIGURE VII.
Tracing of an X-ray photograph showing a tube which has passed well down into the small bowel.

considerable time to a high percentage of X-radiation. Repeated radiographs taken during the introduction of the tube are most helpful and when taken with a portable machine do not distress the patient.¹

The following case illustrates another method of passing the tube through the duodenum.

An elderly spinster, who had had five previous operations for intestinal obstructions by adhesions, again suffered from colicky abdominal pains and vomiting. A Miller-Abbott tube was passed into the stomach, and two hours later at operation it was found that she had a volvulus of the small bowel with a degree of circulatory embarrassment in the twisted loop. The loop was freed and adhesions were divided, and at the same time the head of the Miller-Abbott tube was milked past the mid-point of the duodenum. After operation it was passed down its full length, and eight ounces of fluid and some litres of gas were sucked out with relief of distension. Convalescence was uneventful.

On 25 occasions on which small bowel intubation was performed successfully, the "Magenstrasse" method was used 12 times and the "air" method eleven times, and the tube was put through the duodenum by manipulation under X-ray observation once, and on the operating table once.

Causes of Failure of the Tube to Pass Onwards.

The tube may fail to pass onwards because it has not passed the mid-duodenal point. This is ascertained, as has

¹ Since this article was written a promising method of passing the tube with the aid of an electromagnet has been described.

previously been stated, by the character of the contents aspirated, by the feel of the plunger when the balloon is experimentally inflated, by the rapidity of return to the aspirating bottle of recognizable fluid given by mouth, and last (if necessary) by an X-ray film. The tube may be past the mid-duodenal point, and may fail to move further because the patient has a low serum protein level. The motility of the small intestine has many times been shown to correspond to the serum protein level in the blood. Thus, in the presence of a low serum protein level, the motility of the small intestine is greatly lowered. I have on many occasions noticed that when the tube fails to move down the small intestine, or moves down the small intestine very slowly, a serum transfusion is followed in an hour or so by further rapid onward passage of the tube.

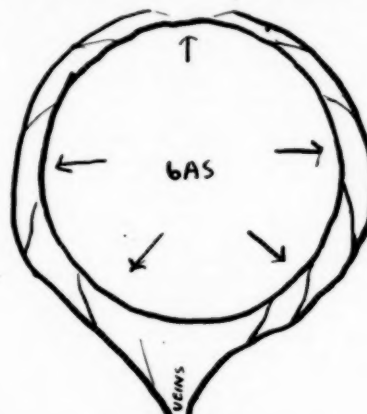


FIGURE VIII.
Showing how distension causes pressure on the veins in the bowel wall and thus interferes with gas absorption from the bowel and in turn leads to greater distension—a vicious circle.

The following case illustrates both the use of the Miller-Abbott tube in the treatment of post-operative ileus and also the effect of an increased serum protein content on the motility of the small bowel.

A man had had an inguinal hernia repaired and an operation for hydrocele, and was quite well for five days. His abdomen then became distended, and he vomited faeculent material frequently. He still had some sounds of intestinal movement, but of incoordinated movement; his general condition was poor, and enemata and pituitrin had been given with little or no result. He had hiccups and a dry, brown tongue.

The Miller-Abbott tube was passed with milk and glycerin by the "Magenstrasse" method, and within ten minutes pure bile was withdrawn. In half an hour twenty cubic centimetres of air were put into the balloon and gave a feeling of resistance to the plunger on the syringe. After ten more minutes the balloon was blown up to forty cubic centimetres, and a distinct spring back of the plunger was felt, and nothing given by the mouth was returned by the tube. Instead of the intravenous administration of saline solution that had been up to this kept running, a transfusion of a pint of serum was given two hours after the first passage of the tube. The rate of advance and the frequency of peristaltic waves were greatly increased; the tube had passed its whole eleven feet by next morning, and in eighteen hours had sucked out 38 ounces of faeculent fluid and a great deal of gas, and the distension was relieved. The tube was then removed and convalescence was thenceforth uneventful.

The tube may cease to progress because it has reached the point of intestinal obstruction. To ascertain whether this is so or not, a small amount of thin barium solution can be run in through the aspirating lumen of the tube and an X-ray picture taken. If operation is then contemplated, the tube should not be removed; it should be left in position, since it acts as a guide to the point of obstruction when the abdomen is opened, and if resection is necessary, complete internal drainage of the suture line is

accomplished with blockage by the balloon of any further downward passage of fluid from above.

The following case history illustrates information gained by the running in of thin barium solution through the end of the tube.

A boy, aged twenty years, had had attacks of colicky pain for four days. He had been given two enemata with relief of pain and a good result each time; but the pain again recurred and his abdomen began to be distended. He had had two previous operations, one for appendicitis and the other for "adhesions". On his admission to hospital his abdomen was grossly distended, and tenderness and a little fullness were present under one of his operation scars. A Miller-Abbott tube was passed, and within twelve hours distension and pain were much less. Barium solution was run in through the end of the tube, and X-ray examination revealed a broken pattern suggestive of incomplete obstruction. At operation, which was performed soon afterwards with the tube still in position, a little free fluid was found in the peritoneal cavity, and the small bowel was distended as far down as an adherent fibrotic knot of small bowel bound onto the back of the scar of the original appendiceal operation. This mass of adhesions was dissected free and small bowel below was found to be collapsed. The tube, which was felt just proximal to the obstruction, was left in position with the balloon empty, and for several days continued to suck out the bowel in the region of the divided adhesions. Convalescence was uneventful.

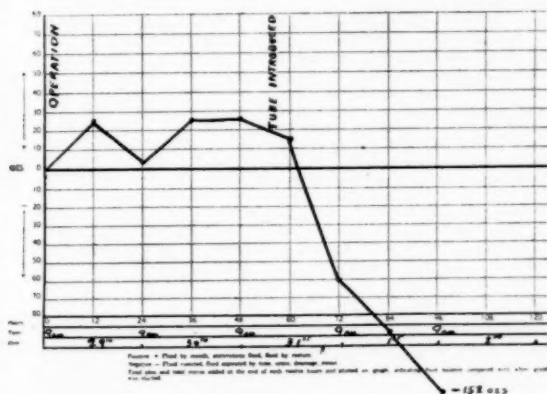


FIGURE IX.

Form for graphic representation of the state of hydration of the patient. This chart illustrates the big upset of fluid balance that occurs when the Miller-Abbott tube is passed on a distended patient. It shows a total loss in fluid of 167 ounces in thirty-six hours.

The tube may not pass down because there may be no peristalsis. This is a rare cause, for as the tube sucks out fluid above and below as it passes, the intestine in the neighbourhood of the balloon is no longer distended, and contracts normally. Thus peristalsis in the "intestine-made-normal" passes the balloon down to the next segment, which is again aspirated and rendered normal and again excited to peristalsis. Thus in cases of paralytic ileus the tube passes through the intestine like a vacuum cleaner, cleaning as it goes. However, in moribund patients no peristalsis may be present, and though the tube is well down, the abdomen comes to act like a fluid lake, and respiratory waves are recorded from the balloon (Figure X). In cases of severe toxæmia from liver or kidney failure with associated distension, the onward passage of the tube may be slow or absent.

The following case illustrates the use of intestinal intubation to give purely symptomatic relief of distension, and to show that even when the patient is almost moribund peristaltic movements occur.

An elderly man had been intermittently jaundiced for fifteen years following cholecystectomy, and the jaundice had been permanent for a year and a half. He was operated upon, the common duct was cleared of much mud and many stones, and a choledochoduodenostomy was performed. It was noted that his liver was enlarged and cirrhotic, and five

days after operation he began to display typical signs of liver failure; he was irrational, his abdomen was distended and he was vomiting frequently. A Miller-Abbott tube was passed and his distension was relieved in twenty-four hours, with the withdrawal of much gas and about four pints of fluid; the tube was then removed. He remained without distension or vomiting until he died on the tenth post-operative day, being by then wildly irrational. The use of the tube had gained for him several extra days of life, in which he might have been able to overcome his liver failure. He had peristaltic movements to his last day.

The tube may not pass downwards because it is insufficiently lubricated at the nose, or because peristalsis is not sufficiently strong to pull it down against its own resistance, and because the tube has not been adequately helped through the œsophagus, nose and stomach. This cause of failure in downward passage of the tube is mainly found when the tube is not far down in the intestine. The patient sometimes will not tolerate the tube and either sleeping or waking pulls it out, sometimes repeatedly.

FIGURE X.

Record, taken from the balloon, of a patient in a moribund condition. Though the tube was well down and had been showing peristaltic movements, respiratory movements were recorded as a terminal phenomenon.

Removal of the Tube.

When the tube has passed down as far as the lower part of the ileum, this is usually all that is required of it, because it has cleared the intestine and given it a new start in life and function; in most cases the tube may be removed. In certain cases, however, as when an intestinal anastomosis has been performed, it is of advantage to allow the tube to remain and continue to drain the anastomosed section. In colonic surgery it is of advantage to have the tube in the lower part of the ileum to keep the intestinal contents from the right side of the colon for some time before and after operation. However, in most cases, as of acute obstruction in paralytic ileus, there is no point in allowing the tube remain down after it has reached the terminal part of the ileum. About eight days is about the longest period for which the average patient will tolerate an indwelling nasal tube, because of soreness of the throat and nose.

Removal of the tube is accomplished by first of all deflating the balloon and recovering all the air by the aspirating syringe that was put in when the tube was introduced. The amount of air introduced was noted at the time of its introduction, and it is most important that the same amount of air should be recovered, or otherwise a semi-deflated balloon may be drawn back through the intestine; such an occurrence has been known to cause intussusception and lacerations. If the balloon has been tied on too tightly and not tested fully before use, the fine balloon inflation lumen may have been obstructed, and the air cannot be recovered. Removal is then difficult and dangerous.

The balloon having been deflated, the tube is gently withdrawn through the nose, the gentle traction being discontinued whenever resistance is encountered. A rate of withdrawal of a foot every five to ten minutes is safe and convenient. In most cases, if resistance to withdrawal is encountered, it is due to spasmodic contraction of the intestine and pylorus caused by the stimulation of the tube's being withdrawn, and this spasm passes off if a small amount of time is allowed to elapse. If a knot has occurred, resistance is greater, and further traction will tie the knot firmly and make removal difficult or impossible. If, when the resistance of a knot is encountered, the removal is stopped and further slack tube is fed down into the stomach, in most cases the knot will undo itself within a few hours.

Results of Passage of the Tube.

The tube passes from above down, emptying the bowel of fluid and gas as it goes. Probably its main beneficial

effect is to break the vicious circle caused by distension (Figure VIII). Fluid and gas are constantly being absorbed from the bowel by way of the veins. The veins to the bowel wall course around the small bowel, and when more than 40% distension is present these veins are pressed on, absorption of gas and fluid from the bowel is interfered with, and a vicious circle of distension results (Figure VIII). Thus, if the distension can be reduced, the bowel has a chance to absorb fluid and gas from the lumen in a normal way once more, the pressure on the veins being relieved. As a consequence of this decompressing action of the tube in improving absorption, the patients who are so treated may be given liquid nourishment by mouth above the balloon of the tube, and this nourishment will be absorbed by the intestine. Glucose egg-flips provide protein and carbohydrate in convenient form. It also follows that, as the tube is passed from above downwards by peristalsis, which it initiates by emptying the bowel in front of it and by its own irritant distension, in such conditions as paralytic ileus the motility of the bowel will be restored, and a "silent" abdomen becomes a "sounding" abdomen.

The following case illustrates the passage of the tube for intestinal ileus, probably caused by low-grade peritonitis.

An operation had been performed on a middle-aged man, who had suffered from diverticulitis of the sigmoid colon with draining sinuses for many years. The tumour mass had been resected and convalescence was uneventful until the third day, when his abdomen commenced to grow distended, and he began to vomit small amounts of brownish fluid. A Reyfuss tube was passed and 68 ounces of fluid were aspirated from the stomach in the following twelve hours. On the next day brownish fluid was still being aspirated and his water balance was low, so he was given 60 ounces of glucose and saline solution and 30 ounces of serum intravenously. A Miller-Abbott tube was then passed, and its presence in the duodenum was recognized an hour later. Eighty ounces of fluid were aspirated in the first twelve hours, and the tube next day was down to its full length. However, when 137 ounces of fluid had been drawn off, the patient began to vomit small amounts of fluid from the stomach, from above the tube. The tube was then withdrawn and passed again later in the day, and during its second passage it drew off 131 ounces in the first twelve hours. The following days produced 70 and 64 ounces of fluid respectively, but despite the administration of sulphonamides, intravenous therapy and the exhibition of penicillin, he died on the ninth day after operation, probably from low-grade peritonitis, 300 ounces or 15 pints of intestinal contents having been removed by the Miller-Abbott tube.

In intestinal obstruction, operation when required is made easier by having the loop proximal to the obstruction end decompressed, and if the tube is allowed to remain in position, when it has reached the obstruction, it serves as a guide to the point of obstruction and its metal tip can be felt in the bowel at that point.

A middle-aged man had had mid-line abdominal pain of a colicky type for two days, and he had been vomiting small amounts frequently. On examination, he was tender in the neighbourhood of the umbilicus, and nowhere else. He had a temperature of just under 98° F. and a pulse rate of 100 per minute. A Miller-Abbott tube was passed; his vomiting ceased and he felt better. However, in twelve hours the pain had continued and his temperature had risen slightly. At operation it was found that for a length of about six inches the lower part of the ileum was engorged, bluish-red and almost gangrenous. The mesentery to this segment of bowel was oedematous. The tip of the Miller-Abbott tube was felt just proximal to the pre-gangrenous segment of bowel. The area of localized regional ileitis was resected, and for the next three days the tube drained the line of anastomosis, the balloon being kept deflated. Progress after the removal of the balloon on the third day was uneventful till the eighth day, when some disruption of the wound occurred. Following anaesthesia to effect suture of this, pneumonia developed and he died.

At operation when a resection is necessary, the suture line is drained and the bowel above the obstruction is kept collapsed and empty. In surgery of the colon it is also of great help to have the ileum above the obstruction drained, so that no fresh influx of intestinal contents to the operation area occurs. Post-operative convalescence in these cases is smoother, because absorption and peristalsis are

more readily and earlier established when the small bowel has been kept empty. Drainage has been advised as a means of lessening the volume of the intraabdominal contents prior to operation on large hernia, so as to allow of intraabdominal reduction of the contents at operation.

By means of the Miller-Abbott tube, the action of many drugs on the small intestine has been studied. Of practical importance in intubation technique is the fact that it has been shown that morphine causes duodenal spasm followed by relaxation lasting up to three hours. Large doses of morphine produce disordered and not propulsive movements of the small bowel. Thus the ileum empties much more slowly after the exhibition of morphine. Experience also shows that barbiturates tend to reduce all intestinal movements, and in one case penicillin in therapeutic doses had no apparent effect on small intestinal movements.

The following case illustrates the use of intestinal decompression as an adjunct to surgery in obstruction three or four days after an appendicectomy; in this case, administration of penicillin had no effect on the intestinal motility.

An elderly man, weighing 17 stone, had a typical attack of acute appendicitis, and at operation it was noted that he had some distension of the ileum and caecum, and also an inflamed and oedematous appendix. Four days after operation his abdomen began to grow distended and he vomited large amounts of faeculent fluid. A Miller-Abbott tube was passed, and in the next two and a half days much fluid and a great deal of gas were sucked off, the distension was relieved and he began to eat semi-solid meals. After two and a half days he inadvertently pulled the tube almost out, and it became firmly knotted and had to be completely removed. A day later he again began to vomit faeculent fluid and the tube was again passed; it was just through the pylorus when an exploratory operation was performed next morning, operation being decided upon because after one decompression the patient's abdomen had again become distended. This operation was performed under spinal anaesthesia, and soon after induction of anaesthesia the tube commenced to aspirate large quantities of bile-stained fluid and gas. At operation motile intestine, greatly dilated, was noted, and also some apparent obstruction in the neighbourhood of the ileo-caecal valve. A small ileostomy was made. Following operation the tube aspirated about 60 ounces of liquid and much gas in the passage of its whole length; it was removed two days later because it had become immovably blocked. Distension was relieved. The ileostomy did not act for two days. During this second passage of the tube peristaltic contractions on the balloon were strong and occurred about every four or five minutes; they were unaltered during the administration of 1,000,000 units of penicillin (30,000 units every two hours) for concurrent pneumonia. The patient had considerable pyloric spasm, and even when the distension of his bowel was relieved, nothing passed out of his stomach for sixteen days after his operation, and for the last week of this period he had to be fed through the Miller-Abbott tube. The tube at one stage came out of the ileostomy.

Fluid Balance.

Once the tube starts to pass down the distended small bowel, great quantities of fluid are sucked out (Figure IX), and it is important that the fluid balance of the patient be watched and a careful record kept of his state of hydration. Any gross deficiencies must be made up by the intravenous administration of fluid; but the intravenous administration of fluid must not be overdone or it will lead to the undesirable effect of hypostatic congestion of the lungs, which may lead to pneumonia, or oedema of the bowel, which may further decrease intestinal motility. It is no use waiting till the patient has crepitations at the base of his lungs—it is then too late.

A sudden drop or sudden rise in fluid intake or output in any one particular day is not of any great significance; but a trend of negative or positive fluid balance over a period of days is of significance, and indicates hydration changes in the tissues as well as within the gut. The type of printed graph shown in Figure IX has been found useful; as is stated in the printed instructions, the fluid balance is plotted cumulatively from an arbitrary time of starting of the graph, and the resultant curve shows the state of positive or negative fluid balance from the time the graph was started.

Conclusion.

In conclusion, it may be stated that intestinal intubation is a procedure which is a factor in reducing the mortality of such conditions as intestinal obstruction, paralytic ileus, peritonitis, and operations on the colon; but it is a procedure which, as stated by Abbott, is attended with some difficulty and danger, and even with a mortality rate. Attention to detail will do much to lessen the dangers and enable the tube to be passed. It is to be deplored that this valuable adjunct to treatment should have waned rather than waxed in popularity since its introduction to Australia some years ago, and this must be attributed to the difficulties of its introduction.

It must be stressed that decompression of the small intestine produces temporary general improvement, even in cases in which bowel is strangulated, and necessary operative measures may thus be delayed until too late because of the general clinical improvement. That is to say, in most cases intubation removes one of the consequences of interference with the passage onwards of intestinal contents, but the writer has not yet seen it remove a mechanical cause of obstruction, though in the literature there are records of effective non-operative cure of obstructions due to kinks and adhesions. However, intubation gives time for inflammatory conditions to clear up of themselves.

Intubation is an adjunct to surgery, not a substitute for it, a part of gastro-enterological technique; but in many cases it is life-saving, and is the only way in which life can be saved. Its early use in conjunction with surgery is to be desired, whereas at present the tendency is to employ it when the patient is too ill to stand any other form of treatment. In small bowel obstruction, immediate intubation followed by operation to remove the mechanical cause of obstruction and then slow decompression during and after operation by the "travelling ileostomy" provided by the tube is ideal treatment.

Acknowledgement.

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A FURTHER REPORT ON THE TREATMENT AT THE CHILDREN'S HOSPITAL, MELBOURNE, OF INFLUENZAL MENINGITIS WITH SULPHONAMIDES AND TYPE-SPECIFIC SERUM.

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IN THE MEDICAL JOURNAL OF AUSTRALIA of April 8, 1944, there appeared a preliminary report by Dr. A. G. Nicholson of influenzal meningitis treated with sulphonamides and type-specific antiserum. From the present series of cases may be estimated the results of a further twelve months' use of the combined therapy as outlined by Dr. Nicholson. This may perhaps be briefly described.

As soon as the diagnosis of *Haemophilus influenzae* meningitis was suspected, the administration of sulphapyridine (or more recently, sulphadiazine) was commenced, generally by mouth, but occasionally intravenously when the patient was unable to swallow. The total amount administered during the first twenty-four hours was approximately six grammes, given in divided doses every four hours, after which the dosage was reduced to three grammes per day, and was maintained at that level until clinical improvement was manifest. Routine tests for sulphonamide concentration in the blood were not undertaken because of wartime restriction of laboratory facilities; but in the few cases in which such tests were made a blood level of between seven and twelve milligrammes per 100 cubic centimetres was found. As soon as the diagnosis was established, either by the detection of *Haemophilus influenzae* in a direct smear of the centrifuged deposit of cerebro-spinal fluid or by cultural methods, *Haemophilus influenzae* type B specific antiserum (prepared at the Commonwealth Serum Laboratories and made available to hospitals for experimental and clinical trial, free of charge) was given intravenously. An initial dose of 90 to 120 cubic centimetres of the serum was given, and the need for further serum therapy was determined by the clinical response, the cell content and the result attending cultivation from the cerebro-spinal fluid.

The technique of administration of the serum was as follows. Eight ounces of normal saline solution and 5% glucose solution were administered intravenously at the rate of two ounces per hour. Ninety to 120 cubic centimetres of the serum were then added to the flask and the serum was administered in two hours. The flask was then refilled with more glucose-saline solution up to thirty ounces, and the subsequent rate of flow was decreased to one ounce per hour. Clinical response was checked by repeated spinal punctures, at intervals of approximately five or six days.

Frequent examinations of the urine were performed for the early detection of possible renal complications. Two

TABLE I.

Name.	Age (Months.)	Sex.	Season and Locality.	Duration and Type of Symptoms Prior to Admission to Hospital.	Cerebro-spinal Fluid Findings.		
					Direct Smear.	Culture and Treatment.	Result.
J.W.	16	Female.	October; suburban.	Drowsiness, three days.	Polymorphonuclear cells and bacilli.	Obtained; sulphadiazine and 120 cubic centimetres of antiserum on day of admission.	Complete recovery after 40 days in hospital.
F.T.	24	Male.	October; suburban.	Persistent vomiting, three days.	1,700 polymorphonuclear cells per cubic millimetre; bacilli present.	Obtained; sulphadiazine and 90 cubic centimetres of antiserum four days after admission.	Complete recovery after 35 days in hospital.
E.M.	16	Female.	October; urban.	Cold and stiff neck, three weeks.	570 polymorphonuclear cells per cubic millimetre; bacilli present.	Not obtained; sulphadiazine and 60 cubic centimetres of antiserum three days after admission.	Death after 32 days.
C.D.	19	Female.	November; suburban.	Convulsions, three days.	896 polymorphonuclear cells per cubic millimetre; bacilli present.	Obtained; sulphapyridine and 90 cubic centimetres of antiserum 12 days after admission.	Death after 17 days.
I.J.	16	Female.	November; suburban.	Irritability, three days.	Polymorphonuclear cells and bacilli.	Obtained; sulphapyridine and 90 cubic centimetres of antiserum on admission, and one week later, 90 cubic centimetres.	Complete recovery after 54 days in hospital.
L.A.	10	Female.	December; suburban.	Drowsiness, two days.	Polymorphonuclear cells and bacilli.	Obtained; sulphapyridine and 40 cubic centimetres of antiserum on admission.	Death on third day, acute pycephalus.
J.M.	32	Female.	January; urban.	Vomiting, two days.	Polymorphonuclear cells and bacilli.	Obtained; sulphapyridine and 90 cubic centimetres of antiserum two days after admission.	Death on sixth day, due to hyperpyrexia.
S.S.	16	Female.	February; suburban.	Fever, vomiting and drowsiness, two days.	Polymorphonuclear cells; no bacilli seen.	Obtained; sulphapyridine and 120 cubic centimetres of antiserum two days after admission.	Complete recovery after 33 days in hospital.
J.R.	14 weeks.	Male.	March; suburban.	Convulsions, eleven days.	Polymorphonuclear cells; no bacilli seen.	Obtained; sulphapyridine and 120 cubic centimetres of antiserum after admission.	Death after six days.
R.S.	28	Male.	March; suburban.	Earache, four days.	Polymorphonuclear cells and bacilli.	Obtained; "Dagenan" and sulphapyridine and 120 cubic centimetres of antiserum on second day.	Complete recovery. In hospital 23 days.
M.Y.	21	Male.	May; suburban.	Discharging ear, eight days.	Polymorphonuclear cells and bacilli.	Obtained; "Dagenan" intravenously, followed by sulphapyridine; 120 cubic centimetres of antiserum on second day.	Complete recovery after 16 days in hospital.
P.O'C.	13	Male.	May; suburban.	Drowsiness, four days.	Polymorphonuclear cells and bacilli.	Obtained; sulphadiazine and 120 cubic centimetres of antiserum on day after admission.	Death on nineteenth day.
R.N.	18	Male.	June; urban.	Weakness and shivering, two days.	Polymorphonuclear cells and bacilli.	Not obtained; sulphadiazine and 120 cubic centimetres of antiserum on day of admission.	Complete recovery after 39 days in hospital.
S.C.	24	Female.	June; suburban.	Cough and shivering, seven days.	Polymorphonuclear cells and bacilli.	Not obtained; sulphadiazine and 120 cubic centimetres of antiserum on day of admission; 120 cubic centimetres repeated eleven days after admission; 2-7-diamino-acridine given intrathecally for last four days.	Death from acute pycephalus and toxæmia 23 days after admission.
T.H.	22	Male.	July; urban.	Semiconsciousness, 36 hours.	800 polymorphonuclear cells per cubic millimetre; bacilli present.	Not obtained; sulphadiazine and 120 cubic centimetres of antiserum on day of admission.	Complete recovery after 17 days.
J.W.	16	Male.	September; urban.	Drowsiness, three days.	Polymorphonuclear cells and bacilli.	Obtained; sulphadiazine and 120 cubic centimetres of antiserum on day of admission.	Sudden collapse and death on fourteenth day.
F.M.	9	Female.	August; suburban.	"Off colour" and vomiting, one week.	Polymorphonuclear cells and bacilli.	Obtained; sulphadiazine and 120 cubic centimetres of antiserum on day of admission; did not respond; second 120 cubic centimetres of serum given without response.	Death after 46 days; pronounced hydrocephalus developed.
A.M.	7	Female.	August; suburban.	Vomiting and loss of weight, two weeks; diagnosed and treated as acidosis.	Polymorphonuclear cells and bacilli.	Not obtained; sulphadiazine and 120 cubic centimetres of antiserum on day after admission; second 90 cubic centimetres given on seventh day without effect.	Death from pycephalus and toxæmia after 24 days.
G.T.	9	Male.	September; suburban.	Vomiting, twenty-four hours.	Polymorphonuclear cells and bacilli.	Not obtained; sulphadiazine and 120 cubic centimetres of antiserum on day of admission.	Complete recovery after 13 days in hospital.
R.C.	9	Male.	September; suburban.	Drowsiness and vomiting, two days.	Polymorphonuclear cells and bacilli.	Obtained; sulphadiazine and 120 cubic centimetres of antiserum on day of admission.	Complete recovery after 16 days in hospital.

children under treatment with sulphadiazine developed hæmaturia; after this experience a routine dose of potassium citrate was administered simultaneously with the sulphadiazine. So far, there has been no further instance of hæmaturia.

Three patients developed toxic erythematous rashes, two from sulphapyridine. In each case the drug was discontinued and in all three no further sulphonamide therapy was found necessary.

Twenty-nine children suffering from influenzal meningitis, all aged under three years, were admitted to the Children's Hospital, Melbourne, from October 1, 1943, to September 30, 1944. I propose to omit nine of these from

the discussion, because treatment did not conform to that outlined above, as will be seen from the following details.

L.B., a female patient, aged two years and nine months, suffering from fulminating meningitis, lived for twelve hours only. The diagnosis was established just prior to death.

J.P., a male patient, aged seven months, suffering from fulminating meningitis, lived for ten hours. The diagnosis was established just prior to death.

J.B., a male patient, aged two months, was a congenital hydrocephalic. Serum was withheld for this reason.

L.P., a male patient, aged four months, and J.G., a male patient, aged one year and four months, were both affected early in the year, at a time when no serum was available.

P.H., a male patient, aged one year, suffering from fulminating meningitis, was moribund on his admission to hospital. Serum therapy was commenced, but death occurred.

R.S., a male patient, aged one year and nine months, was moribund on his admission to hospital, and lived for ten hours. Serum was not given.

W.B. was a male patient, aged eleven weeks. The prognosis was considered hopeless from the hour of his admission to hospital, because of late diagnosis and an established acute hydrocephalus. Nevertheless, serum was given, but was of no avail.

C.W. was a female patient, aged one year and six months. The diagnosis was not established until the post-mortem examination, in spite of repeated spinal puncture and attempts at culture.

The remaining twenty cases are presented in tabular form in Table I.

Comment.

Perusal of the above table will show that ten deaths occurred among a total of twenty patients. If, therefore, we add the four cases reported earlier by A. G. Nicholson, since the commencement of combined chemotherapy and serum we note a remarkable improvement in the results of treatment of influenzal meningitis in the Children's Hospital, Melbourne, over that of the previous six years when the mortality rate was 81.3%. Further analysis of the figures discloses that the average age of the survivors in months was twenty, the youngest child to recover being nine months of age, whilst the average age of infants who succumbed to the infection was 16.8 months.

Amongst the survivors, complete recovery was not assured until an average period of thirty days had elapsed, while those patients who did not respond died within the average period of fifteen days.

In an attempt to determine the causes of deaths in this series, inquiries have been instituted into many factors possibly influencing the prognosis, all without much success. Age, sex, seasonal variation with possible relation to severity of infection, locality, social status, with special regard to poor accommodation, overcrowding and malnutrition—all have been considered in detail, and although it is true that the majority of our patients came from poorer homes, this was to be anticipated in view of the fact that all were treated in a public hospital.

Autopsy was performed on a majority of those children who succumbed to the infection, and on removal of the calvarium a diffuse meningitis was disclosed with depressing monotony. Purulent exudate was widely distributed over the dorsal surfaces of the cerebral hemispheres and was particularly copious at the base of the brain and on the dorsum of the cerebellum and mid-brain. In these situations the exudate was often gelatinous and could not have failed to occlude the foramina of Majendie and Luschka.

The lateral ventricles contained such an excessive quantity of purulent fluid, with purulent coagulum adherent to the choroid plexus on both sides, that Dr. R. Webster, pathologist to the hospital, aptly described the condition as "acute pyocephalus". A finding of *otitis media*, or of mucopus in the mastoid or petrous temporal bone, was inconsistent; in other words, in many of the fatal cases there was no evidence of middle ear disease. The presence of this feature has sometimes been considered to reduce the likelihood of recovery, but this has not been found so in the present series.

In view of the post-mortem findings, it is amazing that obstruction to the free circulation of cerebro-spinal fluid does not develop even more frequently; but in the series under consideration complete recovery has occurred in eleven cases. The infants who recovered have been reviewed in the out-patient department, but no sequelæ have been noted.

Unfortunately, one of the infants previously reported by A. G. Nicholson has developed spastic paresis of a limb, twelve months after discharge from hospital; the cases in the present series will therefore require extended supervision.

In the cases occurring earlier in the year, the type of *Hæmophilus influenzae* was not determined. Type B anti-

serum, however, was administered, and as all the later cases have without exception been due to type B, direct typing does not seem to be a necessary requirement before the administration of type-specific serum.

Conclusions.

If the results gleaned from this series are to be of any practical value to paediatricians, it is necessary to record factors which appear to contribute to the prognosis.

1. The mortality rate is higher among children aged under nine months.

2. Early diagnosis of the complaint and the prompt institution of the combined chemotherapy and serum therapy seem imperative, and for this reason I would urge the more frequent use of the diagnostic lumbar puncture, which in an infant is an exceedingly simple manœuvre, and is fraught with minimal risk only.

3. After the institution of therapy, the most constant signs indicating a poor prognosis are the following: (a) Continued vomiting, which may denote the early formation of a block, with consequent raised intracranial pressure, or uncontrolled toxæmia. (b) Failure of the temperature to respond to treatment within forty-eight hours; this has been one of the most constant signs; a rapid fall of the temperature from, say, 103° F. to 99° F. in twenty-four hours in most cases presages a good recovery. (c) A tendency of the temperature, cerebro-spinal cell count and cultural result to relapse, especially if this occurs within the first week. Influenzal meningitis is characterized by a tendency of the clinical condition to fluctuate or relapse. It does not run the smooth course so typical of meningococcal meningitis. If such relapse is accompanied by a return of the *Hæmophilus influenzae* in the cerebro-spinal fluid, probably loculation is occurring in the cerebro-spinal circulation, and the prognosis is bad. (d) The onset of convulsions, as in any case of purulent meningitis, is an extremely bad sign. (e) Poor general nutrition, which is an important factor in the failure to resist any disease. The rule applies when influenzal meningitis is under consideration.

Summary.

Twenty infants with influenzal meningitis have been treated at the Children's Hospital, Melbourne, in the past twelve months. All have received combined chemotherapy and serum therapy. Ten infants have died. The mortality rate in this series is therefore a vast improvement over the figure for the six years prior to the institution of the combined therapy (81.3%); 64 cases were recorded with twelve recoveries only.

By combined therapy is meant the administration of sulphonamides, whether intravenously or orally, simultaneously with the intravenous administration of type-specific *Hæmophilus influenzae* antiserum type B.

Factors contributing to the poor prognosis in infants are enumerated in an attempt to make this series of some practical value.

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"FOUND DEAD", "DEAD IN BED", AND "COLLAPSED AND DIED".

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In all sudden and unexpected deaths the coroner has inquiries made, and if the circumstances are in any way suspicious, or if there is no medical history and the

subject had not during life been attended by a doctor, he usually directs that a post-mortem examination shall be made.

Amongst these autopsies are those on subjects coming under the categories comprised in the title of this paper. Under the heading "collapsed and died" come not only those persons who died almost instantaneously but also those who have lived a few minutes, even perhaps a quarter of an hour or longer, but were found to be dead on arrival at the hospital. Sudden deaths due to murder, suicide or accidents have been excluded with two exceptions.

Sudden deaths do occur from time to time among hospital patients, as, for instance, from massive pulmonary embolism or from coronary disease. Most of the post-mortem examinations in hospitals, however, are carried out on persons who have been ill for varying lengths of time and whose death is not unexpected. These persons have usually been so ill that they have had no substantial meal for some time, so that the stomach is rarely found full of partially digested food and the lacteals are usually not distended. Frequently, however, amongst the coroner's cases death has occurred soon after a meal.

During the last three years, having carried out by direction of the coroner 100 post-mortem examinations on persons found dead or having collapsed and died before reaching hospital, I have analysed these cases from the point of view of ascertaining what are the most likely causes of such deaths. Twenty-eight persons were found dead other than in their beds, 20 were found dead in bed, and 52 had collapsed and died before their arrival at the hospital. Table I gives an epitome of the causes of death under the three categories mentioned.

As might have been expected, it is seen that coronary atheroma and its consequences were responsible for 40% of these deaths. Nearly half of those who collapsed and died, died from this cause; but it did not play such a prominent part in the case of those found dead. Nine persons died from hypertrophied hearts which had failed. In six subjects very little was found except some dilatation of the heart to which death was attributed, no other reasonable cause for the death suggesting itself. A man, aged fifty-seven years, found dead in bed had considerable fragmentation of the heart muscle (whatever significance this may have), with slight blood infiltration, very little atheroma in the coronaries and a slightly enlarged and dilated heart (weight 14 ounces or 397 grammes). Four of the patients had valvular disease of the heart, and one died from transverse rupture of the ascending aorta.

There were 15 examples of hæmorrhage within the cranium. Five instances of cerebral hæmorrhage were in persons found dead; two pontine hæmorrhages and a cerebellar hæmorrhage were found in persons who had collapsed and died. Pia-arachnoid hæmorrhage, usually from a ruptured berry aneurysm, was found seven times, four times in patients who had collapsed and died, once in a patient found dead, and twice in subjects found dead in bed. In two additional cases an epidural or subdural hæmorrhage was found at the autopsy to be due to an injury which had occurred some days previously. One patient collapsed and died of meningitis on his way to hospital, as did a subject suffering from lobar pneumonia. There were two other examples of pneumonia or abscesses of the lung and one of acute pulmonary œdema. A woman, aged thirty-five years, and about three months pregnant, was found dead in her doorway from massive pulmonary embolism. A man, aged fifty-seven years, was found dying in his bed, which was saturated with blood that had come from a bleeding duodenal ulcer, the intestines being full of blood which had escaped by the anus. One patient died from a ruptured gastric ulcer and another from a ruptured duodenal ulcer. An alcoholic with a cirrhotic liver was found dead. Alcoholism seemed the principal cause of death of four subjects, two who were found dead and two found dead in bed; in the case of one of these, death may have been due to inhalation of vomitus; in another case the alcohol content of the blood taken at the post-mortem examination was very high—namely, 0.44% (in urine, 0.58%). One death was attributed

to heat stroke. In two subjects, one found dead and one found dead in bed, the condition of the kidneys seemed to indicate that death had been due to uræmia.

Returning to the cardiac cases, of the 25 persons out of 52 who collapsed and died from coronary atheroma or its consequences, two—males, aged respectively sixty-five and seventy-four years—died from rupture of an infarcted area with hæmopericardium, and two—males, aged respectively forty-seven and sixty-seven years—had infarction of the heart muscle. The other 21 had varying degrees of atheroma, the lumen being more or less reduced in places and sometimes containing ante-mortem clots, and sometimes with some fibrosis of the heart muscle. Twenty of the 21 were males, aged respectively thirty-five, thirty-seven, forty-two, forty-three, forty-eight (three), fifty-one, fifty-three, fifty-seven (two), sixty-one, sixty-two, sixty-seven (two), sixty-eight, sixty-nine, seventy-one (two) and seventy-eight years, and only one was a woman, aged forty-seven years.

TABLE I.

Cause of Death.	"Found Dead."	"Dead in Bed."	"Collapsed and Died."	Total.
Coronary atheroma or its consequences	8	7	25	40
Small coronaries, atheroma	—	—	1	1
Fragmentation of heart muscle, little coronary atheroma	—	1	—	1
Hypertrophied and dilated heart	—	5	4	9
Valvular disease of the heart	1	1	2	4
"Dilated heart"	3	—	3	6
Transverse rupture of the aorta	—	1	—	1
Right-sided heart failure, silicosis	1	—	—	1
Right-sided heart failure, emphysema, lungs distended as in asthma	—	—	1	1
Massive pulmonary embolism	1	—	—	1
Cerebral hæmorrhage	5	—	—	5
Pontine hæmorrhage	—	—	2	2
Cerebellar hæmorrhage	—	—	1	1
Pia-arachnoid hæmorrhage	1	2	4	7
Meningitis	—	—	1	1
Fractured skull, epidural or subdural hæmorrhage	1	—	1	2
Heat stroke	—	—	1	1
Alcoholism	2	2	—	4
(one inhaled vomitus)				
Pneumonia, abscesses of lungs & cetera	1	—	1	2
Lobar pneumonia	—	—	1	1
Old tracheotomy; inhalation of "lemon punch"	—	—	1	1
Acute pulmonary œdema	—	—	1	1
Cirrhosis of liver; alcoholism	1	—	—	1
Hæmorrhage round pancreas	1	—	—	1
Ruptured peptic ulcer	1	—	1	2
Duodenal ulcer, hæmorrhage	—	—	1	1
Uræmia	1	1	—	2
Total	28	20	52	100

Of the eight persons with coronary disease out of the 28 found dead, a male, aged seventy-seven years, had infarction of the heart muscle, and six males (aged respectively fifty-two, fifty-four, seventy-two, seventy-three, seventy-five and eighty-three years) and one woman (aged sixty-four years) had coronary atheroma, often with some fibrosis of the heart muscle. The following case shows the suddenness of some of these deaths.

A man, aged fifty-four years, riding his bicycle and smoking, fell off the bicycle and was picked up dead with his pipe still held between his fingers. He had moderate atheroma of the coronary arteries with a good deal of fibrosis in the right side of the left ventricle of a rather hypertrophied heart (weight 16 ounces or 453 grammes).

The quiet way in which such persons may die is shown in the case of a soldier, aged fifty-two years, who at its journey's end about 7 p.m. was found sitting dead in his

seat on a bus; he had considerable coronary atheroma with partial occlusion of the lumen in places, some fibrosis of the heart muscle, which was rather hypertrophied and dilated (weight 18 ounces or 510 grammes), and deeply congested lungs, liver and kidneys.

Of the seven persons found dead in bed from coronary disease, one, a man, aged thirty years, had infarction of the heart muscle, and the others (four males, aged respectively fifty-seven, fifty-seven, sixty-one and sixty-eight years, and two women, aged respectively sixty-seven and sixty-nine years) had merely the atheroma.

It thus appears that 36 out of the 40 sudden deaths from coronary disease were among men and only four among women. The early age (thirty years) of one subject of cardiac infarction should be noted, as well as the deaths at thirty-five and thirty-seven years and five deaths in the forties from coronary disease without infarction.

Summary.

By far the commonest cause (40%) of sudden deaths, especially of those persons who collapse and die before they can reach hospital, is coronary atheroma or its consequences. In six of the 40 cases the cardiac muscle was infarcted, and in two of these it had ruptured, causing haemopericardium. Some of these persons were young (thirty, thirty-five and thirty-seven years). Nearly all (36) were males. Five persons found dead in bed, and four who had collapsed and died, had hypertrophied hearts (presumably from hyperpiesis) which had failed. Valvular disease of the heart accounted for only 4% of these sudden deaths. In six of the 100 very little cause for death was found beyond some dilatation of the auriculo-ventricular orifices, and in one or two others only trifling coronary atheroma was found. Is sudden cardiac inhibition responsible, and if so, how can it be recognized at autopsy?

Pia-arachnoid haemorrhages (seven cases), usually from leaking berry aneurysms, are nearly as likely to be the cause of sudden death as haemorrhage in the brain itself (eight cases).

HEMIAPLASIA OF THE THYROID GLAND.

By HUGH R. G. POATE AND S. L. SPENCER,
Sydney.

A BRIEF discussion of hemiopia of the thyroid gland is presented, and two cases of hemiopia are reported. They were encountered in the practice of one of us (H.P.). For practical purposes the rarity of the condition may be judged from the fact that in 1938, when two earlier cases were reported⁽¹⁾ from the practice of the same author, a survey of the literature revealed only 28 cases. Since 1938 it would appear that only one further instance has been recorded,⁽²⁾ of which the account is not available in Australia.

No figures seem ever to have been presented showing the incidence of abnormalities of thyroid development found at extensive unselected post-mortem examinations, the available statistics being those from observations made during operations on the gland. Only a qualitative impression can, therefore, be gained of the frequency of the condition; but it may be stated that its incidence is such as to indicate the wisdom, at operations for goitre, of exposing and palpating both lobes of the thyroid gland before proceeding to the removal of any part. It is with the aim of again stressing the need for this care that the following two cases are recorded.

The danger of inadvertently removing the patient's entire thyroid tissue is increased by the unfortunate fact that in the great majority of cases of hemiopia it is the left lobe which fails to develop. (In both of the cases recorded below the left lobe was lacking.) As it is almost universal practice in thyroid surgery to commence the attack on the right side, the operator may detach this

lobe from its vascular supply before becoming aware of the absence of the left lobe.

Embryology.

The thyroid gland develops from a single median outgrowth from the ventral pharyngeal endoderm in the region of the *tuberculum impar*. This ordinarily bifurcates, the resulting bilobed end to the outgrowth forming the lateral lobes and isthmus of the fully developed thyroid gland. Persistence of the lowest portion of the median tract results in the development of a pyramidal lobe, while the more cranial part may remain and give rise to such abnormalities as thyroglossal cysts and lingual thyroids. Hemiopia may be regarded as being due to failure of the median tract to bifurcate, or to the absence of development of one half of the bilobed embryonic precursor of the thyroid gland. It is not known what influences bring about this error, or why the left side should be affected so much more frequently than the right (probably some seven times as often).

At one time it was believed that a large part or even the whole of the lateral lobes of the thyroid gland was developed from an endodermal outgrowth on each side from the fifth pharyngeal pouch—the ultimobranchial bodies. According to Keith,⁽³⁾ the tissue so produced is for a time applied to the dorsal aspects of the developing lateral lobes, but apparently soon degenerates and disappears.

Reports of Cases.

CASE I.—The patient was a police constable, aged forty-one years, who had lived during the greater part of his life in various country districts of New South Wales. He came of healthy stock, the only relevant detail obtainable regarding the family history being that one sister had suffered from goitre.

The patient stated that nine months before he sought medical advice his wife had noticed a swelling in his throat. He himself complained of nervousness and of "losing his grip". Slight breathlessness was present on exertion. On examination, it was observed that his pulse rate was 80 per minute. He had no tremor. In the right lobe of the thyroid gland an adenoma the size of a walnut was palpable.

At operation an adenoma of the size described was found in the right lower pole. The left lobe was completely absent. The lower part of the right lobe containing the adenoma was removed. Some apparently healthy gland remained at the right upper pole. A search of the recognized areas for aberrant thyroid tissue was fruitless.

CASE II.—The patient was a married woman, aged thirty-four years, who had for 22 years noticed a swelling in her neck. The patient's mother had suffered from goitre. The patient herself stated that she had been nervy and "run down" since her confinement six years before, her condition being worse during the last six months. She complained also of palpitation and of flushed feelings in the neck. The swelling was thought to be increasing in size.

Examination revealed that the eyes were prominent and the pulse rate was 110 per minute. The thyroid gland felt very hard.

At operation the right lobe was found to be the seat of a large adenoma, and was removed. The left lobe was completely absent, and no other thyroid tissue could be found.

Conclusions.

Hemiopia of the thyroid gland occurs infrequently, but is met often enough to require the surgeon to expose both sides before commencing the removal of thyroid tissue. The danger of inadvertently removing a solitary lobe is increased by the fact that in the majority of instances it is the left lobe which fails to develop. Further, those patients in whom hemiopia has been encountered have mostly been in the age period in which active thyroid tissue is necessary.

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- ⁽²⁾ E. Torroella: "Anomalia poco frecuente del cuerpo tiroideo (bocio)", *Revista medica cubana*, Volume LIII, November, 1942, page 972.
- ⁽³⁾ A. Keith: "Human Embryology and Morphology", Fifth Edition.

Reports of Cases.

A CASE OF CHRONIC SOLID SUBDURAL HÆMATOMA.

By R. A. MONEY,

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Solid subdural hæmatoma is fortunately one of the rarest intracranial complications of head injury, according to Munro.⁽¹⁾ In a series of 310 verified cases of all types of subdural clots, chronic hæmatomata occurred only 45 times, and furthermore, in only three of these cases could a diagnosis of brain injury be made. Frequently the injury which causes this condition may be so slight as not to be accompanied by unconsciousness. These clots produce symptoms which vary from mild, persistent or intermittent headache to those which are usually associated with large brain tumours. Patients with these symptoms and signs usually provide such baffling problems that neurosurgical investigation, including even pneumoencephalography and operation, may be necessary before cause-and-effect relationship between the alleged accident and the resultant findings is established.

Since the estimated occurrence of all subdural hæmatomata varies from 1% (Landig *et alii*)⁽²⁾ to 10% (Munro⁽¹⁾) of head injuries, and since the incidence of the solid type of clot is only 14% of that, it is felt that the following case is rare enough, and of sufficiently difficult diagnosis, to warrant reporting.

Clinical Record.

Sergeant A.B., aged twenty-three years, Royal Army Service Corps, was admitted to a neurosurgical centre at an Australian general hospital in the Middle East on September 25, 1942, with a provisional diagnosis of intracranial tumour. At the age of sixteen years he had injured his head when he fell from a bicycle. He was told that he had sustained a depressed fracture of the skull in the right frontal region and that he was unconscious for about two days. He apparently made a complete recovery. At the age of eighteen years he had had a discharge from his left ear for a few weeks. This had recurred slightly at times recently, but had never been profuse. He sailed from Great Britain with his unit in May, 1942, feeling well. He arrived in the Middle East in July, and soon afterwards attended sick parade, complaining of "weakness turns" followed by giddiness and nausea. He was told that they were due to biliousness and "stomach upsets" and was given medicine. Three weeks later he complained of headache, and the "weakness turns" became associated with vomiting. These "turns" increased in severity and frequency, so that he gradually became weaker and lost weight. The headache was usually left-sided and extended from the frontal to the occipital region. Towards the end of August he was referred to a nearby field ambulance for observation, but no definite diagnosis was made and he returned to his unit with the label "N.Y.D. gastric". Early in September he was referred to a general hospital, where a Röntgenological examination of his alimentary canal after a barium meal and a fractional test meal was carried out, but no abnormality was found. His eyes were also tested and he was given glasses to correct an error of refraction.

About September 15, 1942, as his symptoms were growing worse, he was referred to another general hospital. Early papilloedema was observed in both eyes and a raised intracranial pressure of 180 millimetres of water was discovered by spinal puncture. Examination of the cerebro-spinal fluid showed that it contained no cells and that its protein content was 40 milligrammes *per centum*. Röntgenological examination of the skull revealed some generalized thinning of the vault and uncertain evidence of an old depressed fracture in the right frontal region. The Wassermann and Kline tests both failed to produce reactions with the blood and cerebro-spinal fluid. He was then referred to the neurosurgical centre of an Australian general hospital.

On admission to this hospital, he stated that his headache had become much worse and continuous since the spinal puncture. It was still situated mainly on the left side, over and behind the left eye. It was less severe when he lay down, and became almost unbearable on his attempting to sit up; in fact, it was difficult to persuade him to sit up at all. He complained of occasional attacks of vomiting. They came on suddenly and were projectile in nature. On

examination, he lay on his back or curled up on his left side. Tenderness was elicited on percussion of the left side of his head, most pronounced in the fronto-parietal region, and slight stiffness was present in the muscles at the back of his neck. In both fundi early papilloedema was present, but the fields of vision were full. Slight nystagmus was noticed when he looked to the left. Slight hypotonia and incoordination were elicited in the left upper and lower limbs. The tendon reflexes were present and equal on both sides, and there was no loss of muscular power. With great difficulty, he was assisted to sit up and then to stand. He was unsteady and swayed backwards and forwards. He could walk only with assistance, and if he was left alone, propulsion or retropulsion was observed. The erect posture caused exacerbation of his headache. A mild degree of external otitis was the only abnormality seen in the left ear.

From the above findings, the presence of a cerebellar tumour on the left side was suspected, and on September 29 preparations were begun for an exploratory suboccipital operation. As a preliminary step, under local anaesthesia, burr holes were made in the skull over both occipital lobes in order to tap the posterior horns of the lateral ventricles and estimate their size. On the right side, no abnormality was detected, but on the left side the *dura mater* was thick and discoloured, and when it was cut through, brown fluid and old liquid blood escaped, indicating the presence of an old-standing subdural hæmatoma on that side. About an ounce of liquid was evacuated by gentle lavage and suction, with immediate relief of symptoms, and a small piece of corrugated rubber was inserted for a distance of five centimetres in a forward direction. It was hoped that the remainder of the hæmatoma would drain out this way.

In reply to cross-examination after the discovery of this hæmatoma, the patient recollected that about the end of March, 1942, whilst playing "soccer" football, he had received a blow or kick on the head, which knocked him down. He apparently got up and continued the game, but did not remember anything about it. He played on for at least half an hour or more in a dazed condition; yet this minor injury must have been sufficient to tear one of the cerebral veins entering the sagittal sinus and start bleeding into the subdural space.

For the next few days his condition improved greatly, although only small amounts of brownish fluid drained away despite daily probing. On October 9, about half an hour after removal of the rubber drain and without any warning, he suddenly had a generalized epileptic seizure. On two or three occasions previously he had complained of a peculiar sensation in the right side of his face, tongue and upper extremity whilst the rubber drain was lying in the vicinity of the sensory area of the parietal lobe. In view of this, and as the papilloedema was not subsiding, it was thought that more of the subdural hæmatoma as yet undrained must be present over the left half of the cerebrum. That afternoon, under local infiltration anaesthesia, three more burr holes were made anteriorly and laterally. From these additional holes, after the thick *dura* had been cut through, brownish liquid could be evacuated by a brain needle inserted to a depth of about two centimetres, but only small quantities could be obtained at any one place. A soft tube was left in the antero-medial hole, the incisions were closed and the patient was returned to the ward.

Some drainage of brown fluid and old blood took place during the next three weeks, but headache persisted and the papilloedema increased. Several spinal punctures were performed; the pressure of the cerebro-spinal fluid varied between 210 and 270 millimetres of water, and the protein content rose to 100 milligrammes *per centum*. On November 3 an encephalographic examination was made with the patient lying on his right side, as an attempt to carry out this procedure with him sitting up had resulted in a syncopal attack. Air only entered the left lateral ventricle, but Röntgenograms taken afterwards showed that the ventricle was deformed and displaced beyond the middle line over the right side of the *falc cerebri*. It was then obvious that a large, probably clotted, and organized subdural hæmatoma was still present. Accordingly, on November 7, under local infiltration anaesthesia after the hypodermic administration of "Alopon", the burr holes already made in the skull were connected by a Gigli saw, and a large osteoplastic flap was raised over the left side of the cerebrum to expose the parietal lobe. The thickened *dura* was incised and reflected, and a substance having the appearance of liver was encountered in all directions, except at the extreme postero-inferior angle where a small portion of normal brain could be seen. This liver-like mass represented a solid subdural hæmatoma. The *dura* was separated from it with difficulty and much hæmorrhage, and commencing at the postero-

inferior corner, the mass was then peeled off the underlying arachnoid and brain fairly easily. Its posterior, inferior and median limits could just be reached. Its anterior limits extended down over the frontal lobe to the frontal pole, and it was only with extreme difficulty and much hæmorrhage that this portion of the mass was removed. The size and shape of this hæmatoma can be seen in Figure I. After its removal, the whole lateral surface of the left side of the cerebrum was visible. The brain would not expand to fill the cavity and pulsed only feebly. It seemed to be compressed and infiltrated with glial tissue. The cavity was filled with normal saline solution and the *dura mater* was closed except where a soft rubber tube was inserted for drainage from the posterior median angle. The bone flap was replaced and kept in position with wire sutures.

After a parlous immediate convalescence due to loss of blood and shock the patient made a good recovery. During the next three weeks some brownish fluid drained from the

dura and the brain. About thirty cubic centimetres of this fluid was subsequently withdrawn by needle and syringe.

After these procedures no further seizures occurred and the patient's general condition gradually improved. The papilloedema began to subside, and he was able to get up and walk about without headache or unsteadiness. Despite this improvement, spinal puncture on December 28 showed the intracranial pressure to be still 210 millimetres of water, although the fluid was now clear and the protein content was only thirty milligrammes *per centum*. A considerable amount was allowed to run off before the pressure fell to 150 millimetres of water. It was considered that the increase of pressure was now due to excess of fluid only, and did not necessarily mean that a fresh hæmatoma had collected. On January 3 he was sent to a British convalescent depot for graduated exercises and rehabilitation *et cetera*.

On January 24 he was examined at the convalescent depot.



FIGURE I.

postero-median burr hole, and blood-stained yellowish fluid was aspirated daily with a needle and syringe through the antero-inferior burr hole deep to the temporal muscle. This fluid used to collect in the space between the dura and the arachnoid previously occupied by the hæmatoma, into which the brain should have expanded. Despite these aspirations and repeated spinal punctures, the intracranial pressure remained above 200 millimetres of water, although the protein content of the cerebro-spinal fluid fell to 45 milligrammes *per centum*. The papilloedema appeared loath to subside, although the headache was relieved and vision improved. On two occasions after exploration of the sinus a Jacksonian seizure occurred, limited to the right side of the body, and on another occasion after the withdrawal of fluid by syringe and needle through the left temporal muscle, a seizure occurred after the needle had been inserted more deeply. These occurrences indicated that the cortex in the region of the left motor and sensory areas was extremely irritable; after them the patient became nervous and apprehensive, with dilated pupils and bradycardia almost approaching syncopal attacks at times.

On December 2 encephalography was again performed, this time under "Avertin" anaesthesia, which enabled the procedure to be carried out with the patient sitting up, and a more satisfactory result to be obtained. The air entered both lateral ventricles, and the Röntgenograms showed that, although the deformity in the shape of the left lateral ventricle had disappeared, it was still displaced to the right, though not as far as previously. This was probably due to gliosis preventing expansion of the left cerebrum and to the presence of subdural fluid instead of the hæmatoma between

His condition had improved in every way and the papilloedema had completely subsided. He complained only of occasional slight pain over the left eye and had had no further attacks of "weakness", vomiting or giddiness. His weight had increased by over a stone. No more seizures had occurred. He was ordered a further month's convalescence with more strenuous graduated exercises; but owing to the extent of the damage which had been done to the brain, after its prolonged compression, it was suggested that he be downgraded and marked for "sedentary duties" with his unit, which he could well do.

Acknowledgements.

The valuable cooperation and technical assistance rendered by Major S. V. Marshall, anaesthetist to the hospital, and Major K. B. Voss, the radiologist to the hospital, during the carrying out of the encephalographic examinations and during the operation are gratefully acknowledged. The Director-General of Medical Services at Allied Land Forces Headquarters, Melbourne, has kindly given permission for the publication of this report. The photograph shown in Figure I was taken by the photographic section of Number 5 Squadron, Royal Australian Air Force.

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Reviews.

SYPHILIS.

THE "Essentials of Syphilology" by Rudolph H. Kampmeier, associate professor of medicine, Vanderbilt University School of Medicine, is a useful publication.¹ It is a survey of syphilis written for the general practitioner and of value to all who do not desire extensive and detailed discussions on diagnosis and control of syphilis. The book has evolved from the short post-graduate course which is conducted at the syphilis clinic, Vanderbilt University Hospital. This clinic is a special one in the department of medicine and cares for all patients with syphilis who are over fifteen years of age, irrespective of the manifestations of the disease. With this background, the author claims that an opinion has been developed "as to what knowledge is essential to the general practitioner or health officer for the diagnosis and treatment of the great majority of syphilitic patients".

Syphilis is surveyed as a systemic disease and the need for thorough physical examination and an adequate medical history record is emphasized. Dark field examination is briefly mentioned and serological diagnosis is discussed at greater length, though technique is not described. Misleading results are discussed and mention is made of some diseases liable to cause biological false-positive results to tests. False positive reaction in normal individuals is also mentioned. The discussion on the interpretation of serological results is helpful, as even those who are experienced are not infrequently bewildered by laboratory reports.

Treatment with arsenicals, the contraindications and untoward reactions are considered in detail. At the Vanderbilt University Hospital arsphenamine ("606") has been the drug of choice in the treatment of early syphilis, being considered the most potent of the arsenicals with results in acute syphilis "superior to those obtained with other trivalent arsenical drugs". The author recognizes, however, that as general practitioners or officers at public health clinics will treat the majority of syphilitics, the use of arsphenamine will be impracticable and the newer forms of arsenic must be used.

Massive dose therapy is briefly mentioned, but is not considered a desirable method for use at present by the average practitioner.

The heavy metals, bismuth and mercury, the technique of their administration and the signs of untoward effects receive adequate consideration.

The use of iodides is regarded as empirical, but as having a place in the treatment of all late manifestations of syphilis especially at the beginning of late treatment where they will possibly give protection against a Herxheimer reaction when arsenic is used later. Iodides are not advised in the presence of thyrotoxicosis or active pulmonary tuberculosis.

The procedure of fever therapy is not detailed, but the therapeutic action of fever is discussed. In general, patients over fifty years of age are not considered suitable for fever therapy, "though physiologic age is of greater importance than chronologic age".

The need for accurate diagnosis is emphasized and warning is given that "in the treatment of early syphilis there is no place for inadequate dosage, or short courses of the arsenicals, nor place for rest periods from treatment, as may be the case of late syphilis".

The author favours alternating courses of arsenic and bismuth. Treatment is continued in acute syphilis until blood tests have given negative results for at least a year. If serological reversal of a positive reaction does not take place, treatment is continued for at least two years, and in such cases two courses of twelve weeks each of bismuth with intervening rest periods of three months are given in the third year.

A lumbar puncture is performed at about ten to twelve months, and if reversal of serological findings has not been obtained, is repeated at the end of six months.

Primary and secondary syphilis is considered in reasonable detail and a number of excellent illustrations accompany the text. The chapter on early syphilis deals with special features and complications which may occur, such as resistance to treatment of acute lesions, and progression under treatment, clinical relapse, serorelapse and reinfection. Case histories cover many of the conditions mentioned.

¹"Essentials of Syphilology", by Rudolph H. Kampmeier, A.B. M.D.; 1943. Philadelphia: J. B. Lippincott Company. London: Macmillan and Company, Limited. 8" x 5", pp. 534, with 87 illustrations, one of which is in colour. Price: 25s. net.

Latent syphilis, its treatment and prognosis, "Wassermann fastness" and the facts which should be made known to every patient with latent syphilis, are well covered. Late benign syphilis, cardio-vascular syphilis and syphilis of the central nervous system, also receive consideration in degree sufficient for the purpose of this book.

Syphilis and pregnancy, congenital syphilis, and marriage and syphilis, are dealt with in chapters of special importance to those interested in the effect of syphilis on family life. The chapter on congenital syphilis is by J. Cyril Peterson, and gives sufficient information for adequate appreciation of the condition, its course, manifestations, diagnosis and treatment. "Acetarsons" is mentioned as useful in the treatment of infants with congenital syphilis, but not for children older than four years. It is given by the mouth, dissolved in a portion of the child's formula or other liquid food. Other arsenicals mentioned are sulpharsphenamine, neoarsphenamine and arsenoxide. Bismuth salicylate in oil or mild mercurial ointment (United States Pharmacopoeia) supplies heavy metal therapy.

The four closing chapters are by Alvin E. Keller and deal with administrative control and general educational measures; they are of value in focusing attention on the background and contacts of the syphilitic patient. Keller, in the closing paragraphs of his contribution to the book, mentions certain obstacles which add to the difficulty of control of infection. The medical practitioner is to blame in a major degree for his failure to assume responsibility for the adequate treatment and follow-up of syphilitic patients. "Poor technic and obsolete methods discourage a great many patients and account for delinquency in treatment." This is written from an American experience, but those who are in close touch with venereal problems know that it is true, in varying degree, in all parts of the world.

The "Essentials of Syphilology" may be recommended as a book well planned, easy to read and with practical information tersely presented. The illustrations are clear and helpful and the references at the end of chapters guide to more detailed information when desired.

DISEASE IN MANY TONGUES.

AN unusual volume is the "Polyglot Glossary of Communicable Diseases", published by the Health Organization of the League of Nations.¹ It is an attempt to overcome the curse of Babel for communicable diseases and gives their equivalent names in twenty-four European languages—German, English, Bulgarian, Danish and Norwegian, Spanish, Estonian, Finnish, French, Greek, Hungarian, Icelandic, Italian, Latvian, Lithuanian, Dutch, Polish, Portuguese, Rumanian, Russian, Serbo-Croatian, Swedish, Czech and Turkish. Latin has also been added. In three Slavonic languages the names are given in both Cyrillic and Roman characters. Both official names for diseases and those in common use are included.

For twenty years reports in all languages on communicable diseases and causes of death have poured into the Service of Epidemiological Intelligence and Public Health Statistics at Geneva. The staff had to draw up for their own use lists of names of diseases in various languages. These have now been extended, correlated and published by Dr. Yves Biraud, the head of the service.

Dr. Biraud remarks that the names of diseases in different languages often present sufficient resemblance to facilitate their translation, but there are a number of pitfalls or "false friends" where identical words have different meanings in different languages. Thus in French the word "anthrax" means a conglomeration of boils, not a specific infection with *Bacillus anthracis*, and in German "Typhus" is a common term for enteric fever. When such an institution as the International Red Cross at Geneva receives an urgent request for anti-typhus vaccine some difficulty may arise as to which vaccine to send. One error has been noted in this carefully compiled glossary—confusion between *lymphogranuloma inguinale* and *granuloma venereum*.

The glossary will find its greatest use in health departments with international associations. It may be helpful to doctors entering occupied territories or practising in polyglot communities. It might also interest hypochondriacs who could, with its aid, be ill in twenty-four languages.

¹"Polyglot Glossary of Communicable Diseases: Contribution to the International Nomenclature of Diseases"; League of Nations, *Bulletin of the Health Organization*, Volume X, Number 3, 1943-44, by Y. Biraud, M.S., M.D., D.P.H.; 1944. 6" x 9", pp. 356.

The Medical Journal of Australia

SATURDAY, MARCH 3, 1945.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE HEALTH OF GREAT BRITAIN.

THE medical profession in Australia has always been interested in the public health in Great Britain, but since the outbreak of war the reports issued by the Ministry of Health have taken on a new significance. They have shown not only the stamina, the essential soundness of the people in the Home Land, but they have also shown that the hope of the people, their faith in the leaders of their choice, their refusal to contemplate anything but victory, are not likely to change for want of a sure foundation. There is nothing really the matter with a people, besieged as those in Great Britain have been, when they can, for example, so deal with essential foodstuffs that are in short supply that vulnerable groups in the community receive the preferential treatment due to them and others are content that it should be so. The summary report of the Ministry of Health for the year ended March 31, 1944, was presented by the Minister of Health to Parliament by command of His Majesty the King in November, 1944. It has since been printed by His Majesty's Stationery Office.

The Minister, the Right Honourable Henry Willink, in the letter of presentation that serves as a preface to the report, states that consistently throughout the war the vital statistics of England and Wales have been amongst the most unexpected and cheering items of news on the home front. The health of the nation was maintained into the fifth year of the war. "Progress towards safer motherhood and healthier childhood continues, with new records for maternal, infant and child mortality and for stillbirths. In spite of the short but sharp influenza epidemic and the tiredness inseparable from continuous strain, general health was at least as good as it was in peace-time, and in some respects rather better. For many diseases—including typhoid fever, diphtheria and tuberculosis among females—the mortality at all ages was not only extraordinarily low for the fourth year of war, but the lowest ever recorded." This is indeed a record of which any Minister

of the Crown might be proud. But in the war against disease and against the conditions that make its occurrence possible there can be no standing still, no complacency. The Minister does not fold his hands and say that everyone has been splendid and that all is well. Like a good soldier he wants to press on with his campaign. The two points that for him stand out clearly from wartime experience are, first, how well the public health has been maintained, and secondly, how much ill health exists and how much remains to be done. New low records in vital statistics are not enough. The public knows that the country's health record is not so good as it might be. Thus it follows that the essential importance of the fact that ground has not been lost during the war is that it should enable a more rapid advance to be made when peace returns.

The total number of deaths registered in England and Wales in 1943, including those of service men and women in the country and of civilians due to enemy action, was 501,464; this number was 21,327 more than in 1942. In the civilian population the standardized death rates per thousand living were 9.67 for males and 6.98 for females, compared with 9.53 and 6.84 respectively in 1942. The point that should be noted about the death rates is that, notwithstanding the effect of withdrawal of so many healthy young adults from the civilian population, the rate was substantially lower than in 1938 or 1939 for females and slightly lower for males. Although an influenza epidemic in the late autumn raised the mortality in the last quarter of 1943 to an unusually high level, new low records were still established for the corrected infantile mortality rates. In comparison with the 1942 rate, increases were noted at ages twenty-five and over ranging from 1% to 4% of the rates. The number of live births registered was 683,213, or 29,174 more than in 1942; the rate of 16.5% was the highest since 1928. Stillbirths were 30 per thousand total births, compared with 33 in 1942, the lowest rate previously noted, and 38 in 1938. At the risk of quoting too many figures it must be stated that of 47,597 deaths from infective diseases, 12,616 were attributed to influenza. The total cost of the epidemic was about 30,000 deaths and these occurred chiefly among persons of advanced age. Deaths from tuberculosis totalled 25,649 and those from respiratory tuberculosis 21,342. Deaths in the latter category for 1942 numbered 20,989. Deaths among females from all forms of tuberculosis were fewer in number than ever recorded before; for males the rate was 4% above the 1938 level, a previous low record. Although the mortality from tuberculosis has been low, it must be noted that the number of new cases reported during 1943 shows a continuation of the rise reported in 1942. The figure for the year was 16.4% higher than in 1940. These figures have two possible explanations. In the first place it may be that treatment of tuberculosis is becoming more efficient, that though infections occur, they are arrested and the patients die from some other disease. It may also be that more tuberculous infections are being notified. In the wartime set-up, when employment is found for people of all ages in industries of all kinds, it is reasonable to suppose that medical examiners connected with these industries or the ordinary medical attendants of the employees would be likely to discover more tuberculous infections than in the pre-war days. Possibly both explanations may apply. In any case there is justification for the conclusion stated in the report that there

must be no relaxation in efforts to combat the disease. A good deal is being done. At the end of the year under review four units for mass miniature radiography had begun work in England and Wales. Nine other units had been delivered to selected local authorities. This is a creditable performance, considering that the highly specialized apparatus has to be manufactured during wartime. "As soon as normal conditions return" it is hoped that this work will be more generally developed as part of the public health services. It should be mentioned that the mass miniature radiography scheme was forecast in the previous year's report. During the year under review a scheme of maintenance allowances for tuberculous patients and their dependants was put into operation by tuberculosis authorities throughout the country. Unfortunately the institutional treatment of tuberculosis has been hampered by a shortage of bed accommodation and of nursing and domestic staff. Some tuberculosis beds were lost by enemy action, but in spite of this the number of beds for tuberculous patients in institutions increased by 1,460.

The position in regard to venereal diseases is interesting. The intensified campaign launched in 1942 was continued. The rate of increase in infections, noted since the outbreak of war, was less pronounced in 1943. Twelve new treatment centres were opened; 42 medical practitioners were appointed under the arrangement authorized by the Ministry for the treatment of patients at private surgeries where a treatment centre could not be reached. Since the war began 29 additional treatment centres have been opened and 147 practitioners have been appointed to carry out treatment at their own surgeries. The number of civilians with early syphilis who attended treatment centres during the year was 9,642 (5,159 males and 4,483 females); in 1942 the number was 9,046 (5,470 males and 3,576 females). The decreasing difference between the figures for males and females is partly explained by the transfer of males in the population from civil life to the armed forces. The number of new syphilitic infections in 1943 was 139% higher in 1943 than in 1939. It has not been possible to assess the incidence of gonorrhoea as closely as that of syphilis, but if the British service figures are taken as a guide, the gonorrhoeal infections were about four times as numerous as the syphilitic. In the previous year's report reference was made to Regulation 33B of the Defence (General) Regulations which was adopted "to secure the compulsory examination and treatment of the comparatively small class of persons who are known to be spreading infection, but who refuse to undertake treatment voluntarily". (See THE MEDICAL JOURNAL OF AUSTRALIA, January 29, 1944, and October 9, 1943.) It will be remembered that a good deal of opposition was aroused by this innovation. According to the present report medical officers of health have found the regulation useful. By its means medical officers of health have been enabled to get into touch with nearly a thousand persons reported as sources of infection and often to persuade them to undergo examination and when necessary a course of treatment. In view of the opposition to this regulation on its introduction, it would be interesting to know the number of persons apprehended under its provisions who were found on examination to be free from infection. As this report is only a "summary", this information cannot be expected to be contained in it. Trained social workers are being

employed in increasing numbers in connexion with treatment centres. The educational campaign carried out by the Ministry of Health in collaboration with local authorities, the Ministry of Information and the Central Council for Health Education, is doing useful work. More than 100,000 letters of inquiry resulting from the campaign have been received and answered. An increasing number of persons have presented themselves for examination at treatment centres and have been found free from infection. During 1943 the number was 70,507, and this number represented 60% of the persons dealt with for the first time at treatment centres during the year; for 1941 the corresponding figures were 34,635 and 44.8%.

In regard to diphtheria immunization the position is not yet satisfactory. It is true that there is at present a decrease in the incidence of diphtheria, but it is pointed out that this may be partly due to the periodicity shown by most infective diseases. It cannot be conclusively shown that the increasing proportion of children immunized and the decline in diphtheria are cause and effect. It is probable that at the end of 1943 about 50% of the population under fifteen years of age were immunized. The child population of England and Wales under the age of fifteen years was in 1943 estimated to be 8,583,000, and during the year 1,039,492 children were immunized under local authority arrangements. A much larger number will have to be immunized before worthwhile results can be expected from the procedure. "There can be no satisfaction with a new low record in diphtheria deaths while there are still as many as 1,370 fatal cases a year. Most of these deaths could have been prevented by immunization."

In the section of the report dealing with women and children we read that during the year 306 additional nurseries were set up by welfare authorities for the children of women war workers. The total number of nurseries at the end of the year was over 1,500 and the original programme had been completed. Applications for the establishment of new nurseries were being considered. Problems of staffing caused much anxiety. Even with the help of the Ministry of Labour scarcity of staff often delayed the opening of certain nurseries. The number of nurseries kept open for the whole period of twenty-four hours to cater for the children of women on night shift, increased to 159. At the end of the year there were no less than 750 wartime nursery classes. In addition to wartime nurseries, the Government Evacuation Scheme has maintained residential or long-stay nurseries for the reception of children under five years of age. These number approximately 400 and contain 13,000 places. The great majority are organized for the reception of children living in an evacuation area where one or both parents have become casualties or have been made homeless by bombing, or can produce reasons why they could not themselves take or send the child away in the event of heavy raiding. Under certain conditions the orphans of service personnel are received. We read that the Ministry has insisted on the maintenance of the highest standards of accommodation, staffing and physical care. It is also pointed out that although many children benefit physically from the healthy surroundings, good food and regular routine of a residential nursery, such a nursery is not to be advocated as in itself a desirable way of life for all children. "The proper place for a baby or toddler is with its mother." True though this undoubtedly is, these

residential nurseries have beyond question met a need that could not be satisfied in any other way. In all, between 30,000 and 40,000 children have during the course of the war spent some time at an evacuation residential nursery.

One of the most interesting sections of the report deals with housing. A summary of this section cannot be attempted. It may be stated, however, that during the year under review no less than 3,000,000 houses had received first-aid repairs; 102,700 badly damaged houses had been restored to use; and 151,000 new houses had been completed. This all happened before the flying bomb attacks started and the housing programme with this event suffered a set-back. Australians will readily believe that the building trade and the housing authorities are facing "with energy and with success" the challenge brought by flying bomb attacks. The statements on housing in England and Wales are by no means the least encouraging and morale-producing portions of the Ministry of Health's "Summary Report".

Current Comment.

FIBROSITIS OF THE BACK.

BACKACHE as a cause of disability has always been a problem, and the number of men seen in the services with this complaint has often worried medical officers. Even when the name "lumbago" was discarded in favour of the anatomically non-committal "fibrositis of the back" complete accuracy was not attained, for, according to W. S. C. Copeman and W. L. Ackerman, the condition is not a fibrositis at all.¹ These authors have carried out some valuable work under conditions of active service and their published results help to supply the previous lack of systematic exploration of the subject. With commendable enterprise they have mapped the areas of the back in young men in the army who had symptoms of the so-called fibrositis, and have made accurate observations of the sites of trigger points. This work they then followed up with attempts at treatment which aimed at abolition of these points, and finally they have made dissections of the back on all patients dying in hospital from whatever cause. Copeman and Ackerman quote Comroe, who as late as 1940 asserted that the ætiology of fibrositis of the back was unknown and that there were no specific pathological lesions. The authors, however, believe that they can explain certain cases of this malady in the back and elsewhere and that they can supply a pathological hypothesis. The lesion which they believe is usually responsible is not found in fibrous or muscular tissue, but in fat. The existence of focal points of pain has been recognized for some time and the surety with which the clinical examiner could demonstrate them depended only on his enthusiasm and thoroughness. Injection of these tender spots or nodules with a local anæsthetic solution has often been very successful, but the effect is apt to be transitory, and it is not always easy to transfix the little node with a needle.

Copeman and Ackerman, in mapping these painful spots in their patients, found that certain areas predominated, ranging from the spine of the scapula to the para-scapular and paravertebral areas, and just above the crest of the ilium. The latter site, just at the edge of the sacrospinalis muscle, is known to be a common one. But the authors went further. Noticing that the pattern of their charts was anatomically consistent, they then dissected a number of backs and found that the basic fat pattern of the back, even in the most cachectic bodies, tallied closely with the pain pattern obtained from patients with "fibrositis". Beneath the subcutaneous fat lies the vascular superficial fascia, and between this and the deep fascia is little or no

fat generally speaking, but deposits of pinkish fat were found by their dissections in certain areas. Copeman and Ackerman believe that this fatty tissue is important in the production of pain in the back, and note that in various sites it extends to synovial tendon sheaths which in the regions examined were found to consist of fibrous fat forming a loose tunnel for the tendon. They believe that a similar process is involved in causing a tenosynovitis in these places and in producing discrete lesions in the other observed sites of election. "Bubbles" of deep fascia containing fat were observed in some subjects, and these could in some cases be readily transformed by pressure into fatty herniæ. Actual herniation was also seen, with or without association with vascular and nervous tissue. The question arises whether these are the sites of the lesions which we call "fibrositic nodules". The authors think they are; they believe that in certain cases the end result of herniation or strangulation of one of these masses of fatty tissue may be a persistently painful node which may in the end become fibrous. They describe the non-pedunculated type of fatty hernia, the pedunculated type and the foraminal type, and give a series of case histories in which the areas involved were surgically explored. This was thought justifiable in a number of cases in which a long history of painful disability was coupled with a failure of all other methods. It is interesting that the removal of the nodules brought about cure. Microscopically the nodules proved to be fatty tissue with some proliferation of young fibrous tissue and considerable vascular congestion. It is admitted by the authors that these advanced lesions represent what is virtually an end result: they do not claim that such well-developed herniations exist in all cases. But their suggestion is that the pain in fibrositis of the back is due to an increase in tension in fatty tissue in certain well-defined areas where tension is anatomically easy to produce, particularly along the borders of the muscles maintaining the erect posture, that is, just where the basic fat pattern, as they term it, can be demonstrated. Œdema can readily occur in the rather primitive structure of fat. When nerve fibrils are involved, reflex disturbances may be added to local pain, and eventually a permanent lesion such as a herniation may occur. Trauma, it will be seen, readily takes a place in the background of the picture. It is further suggested by Copeman and Ackerman that the painful back found in certain acute infections may have a similar ætiology. Their experience in obtaining biopsy material has led them to an improved technique of injection treatment, that of "teasing" the nodules. Where the usual methods of treatment are not successful they recommend that the trigger point should be accurately located, transfixed exactly with a stout needle through which ten to twenty cubic centimetres of a local anæsthetic solution are injected; then the point of the needle should be deeply though discreetly swept round as if to isolate the nodule, an attempt being thus made to destroy its pedicle and disrupt neighbouring nodules.

This work is based on actual observations and provides a more definite basis for the understanding and treatment of this crippling disability. With Copeman and Ackerman's ideas of the pathology in mind it is possible to see what may be expected in varying and perhaps successive degrees of this condition from such treatments as rest, heat and deep massage, and to envisage more clearly the indications for manipulation, injection or more drastic local measures.

INDEX TO "THE MEDICAL JOURNAL OF AUSTRALIA".

OWING to the restrictions on the use of paper and the difficulties occasioned by lack of manpower, the half-yearly index to THE MEDICAL JOURNAL OF AUSTRALIA, which in normal times would have been published with the issue of December 30, 1944, is being issued separately and will be sent to those who wish to have a copy. It will not be necessary for those who received a copy of last half-year's index to ask for another on this occasion. Others should make application to the manager of the journal at The Printing House, Seamer Street, Glebe, New South Wales.

¹ *The Quarterly Journal of Medicine*, April-July, 1944.

Abstracts from Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Tuberculosis Vaccine.

C. W. WELLS AND E. W. FLAHIFF (*American Journal of Hygiene*, September, 1944) vaccinated urban and rural subjects with a single intracutaneous dose of heat-killed tubercle bacilli. Persons who had reacted previously to a test with 1.0 milligramme of old tuberculin received a dose of 0.3 milligramme, those reacting to a test dose of 0.1 milligramme or not reacting at all, received a dose of 0.2 milligramme. Persons reacting to 0.01 milligramme of old tuberculin were excluded from the study. A total of 4,186 persons were treated. All were examined at periods varying from eighteen to twenty-six months after vaccination. Five pulmonary tuberculosis infections developed amongst the vaccinated and ten amongst the controls, a difference not statistically significant. A limited amount of tuberculin retesting was carried out, and 82% of those who originally failed to react responded to the test after vaccination, while only 26% of the control group manifested a response. The authors appreciated the limitation of the value of their experiment, owing to the short time over which it was possible to extend it.

C. W. WELLS, E. W. FLAHIFF AND H. H. SMITH (*ibidem*) have studied the results obtained in man after the use of a vaccine of heat-killed tubercle bacilli among the patients in a mental hospital in Jamaica; they report results obtained by different workers over a ten-year period. The population numbered 2,500, and the deaths numbered 260 per annum; in 72% of cases autopsy was performed and it was found that 25% of all deaths were due to tuberculosis. Only 14% of patients had clinical signs of the disease on admission to hospital. The vaccine used was a bovine strain, Ravenel, and was administered intracutaneously. The retesting of both subjects and controls with both 0.01 milligramme and 1.0 milligramme of old tuberculin showed that sensitization was rapid, and a highly significant difference occurred in the two groups. Three hundred and twenty-five persons who did not react to 1.0 milligramme were vaccinated, and 45 cases of tuberculosis occurred amongst them, while 312 control patients not vaccinated produced 65 cases of tuberculosis. A certain proportion of these infections undoubtedly was acquired during the first six months after admission to hospital, before sensitization had taken place. From a study of the results of this larger scale experiment the authors concluded when there was a special risk of exposure or predisposition to the development of tuberculosis, the use of a heat-killed vaccine of tubercle bacilli was justified in certain groups.

C. W. WELLS, E. W. FLAHIFF AND H. H. SMITH (*ibidem*) have studied the local reactions following the injection of heat-killed tubercle bacillus vaccine. In this series the local reactions fol-

lowing a method calling for the intracutaneous injection of 0.1 milligramme in 0.1 millilitre doses were severe ulceration and delayed healing. This type of local reaction was seen in 50% of patients. A large series of modifications was then tested, and it was found that frequency of inoculation and method of injection had greater influence in producing reactions than the size of the dose. A single dose or a dose divided in two areas at the one sitting seemed to be the surest way of producing sensitization without untoward reactions.

Para-aminobenzoic Acid Requirements of *Corynebacterium Acetobutylicum*.

RILEY D. HOUSEWRIGHT AND STEWART A. KOSER (*The Journal of Infectious Diseases*, September-October, 1944) have made a study of the *p*-aminobenzoic acid requirements of *Corynebacterium acetobutylicum*, and have applied the information to an assay procedure. Very small amounts of the substance were found to be essential for the growth of this organism in addition to small amounts of biotin. If these two substances were added to a relatively simple medium, satisfactory growth of the organism could be obtained under anaerobic conditions. It was found that amounts as low as 0.0004 μ -gramme per millilitre of culture medium could be detected, the growth of an inoculum of *Corynebacterium acetobutylicum* being used as the indicator for its presence. The activity of fifteen chemical compounds related to *p*-aminobenzoic acid was also investigated and a number of them were found to function as a growth factor, presumably acting after conversion to *p*-aminobenzoic acid. Adenine sulphate, guanine hydrochloride, xanthine and uracil also permitted growth in the absence of *p*-aminobenzoic acid. An assay procedure based on the results obtained in this study of the growth requirements of this organism gave reasonably accurate results when applied to a peptone containing an added amount of *p*-aminobenzoic acid. A sulphonamide-resistant *Staphylococcus aureus* produced from ten to one hundred times as much *p*-aminobenzoic acid as its parent sensitive strain, and a sulphonamide-resistant pneumococcus and a dysentery bacillus did not show increased synthesis of *p*-aminobenzoic acid compared with their original sensitive strains, thus confirming a previous report to that effect.

Viability of Air-Borne Bacteria.

K. B. DEERME and the personnel of the United States Navy Research Unit No. 1 (*American Journal of Hygiene*, November, 1944) have studied the effect of temperature, humidity and glycol vapour on the viability of air-borne bacteria. They drew an air current through a long glass tube in which there were three sampling cocks, and modified the entering current so that it could be laden with emulsions of *Salmonella pullorum* cultures and subjected to altered temperatures, humidity and the addition of glycol vapours. Control estimations of the 50% survival rate of organisms in the air were markedly affected by changes from 27° to 37° C. and humidities of from 15% to 80%. The germicidal powers of glycol vapours decreased with increase

of temperature and also decreased as the relative humidity varied from the optimum 45%. The concentration of propylene glycol required to produce the same results were ten to one hundred times that of triethylene glycol. The observed decreases in numbers in all these tests was proven to be due to lethal effects on the organisms, and not to their mechanical removal from the air.

Control of Glycol Vapours in Air.

T. T. PUCK, HENRY WISE AND O. H. ROBERTSON (*The Journal of Experimental Medicine*, November, 1944) describe a device for automatically controlling the concentration of glycol vapours in the air. This was found to be necessary on account of the small margin which exists between effective bactericidal concentration and supersaturation of the air, producing fogging of the atmosphere. They reflected light from a distant source off a rotating copper drum into a photo-electric cell which in turn controlled electrically the vaporizer releasing the glycol into the air; and by the use of a water cooling system, this automatically compensated for variations in temperature. They state that the device has operated efficiently in a hospital ward for a period of months, and that they have found that it should be set up in a position where the air is circulating, and not in a corner, where pockets of still air may be present. They publish diagrams of the principle of operation and the arrangement of the electrical circuit.

Fibrinogen in Normal and Abnormal Plasma.

E. WERTHEIMER, B. SHAPIRO AND I. FODOR-SALOMONOWICZ (*The British Journal of Experimental Pathology*, August, 1944) have studied the stability of fibrinogen in normal and abnormal plasma. In normal samples of plasma treated with fluoride and stored on ice, a precipitate appears after some hours, which redissolves on warming to 37° C. This "cold" precipitate is absent or diminished in the plasma of patients suffering from liver disease, but is abundant in the presence of hemorrhage, prolonged hunger and pregnancy. It was found that the cold-sensitive fraction was identical with a plasma fraction precipitated by 20% saturation with ammonium sulphate, and this provided a means of obtaining quantities sufficient for study. Plasma obtained from rabbits rendered artificially anemic showed the same phenomenon, as did samples from patients with various forms of liver damage; the authors assumed that as the liver is the seat of fibrinogen regeneration, the low values were due to its inability to form sufficient. The authors thought the quantitative relationship of this cold fraction of plasma sufficiently striking to suggest its use as a diagnostic measure.

HYGIENE.

Sulphonamides and Yellow Fever Virus.

HILARY KOPROWSKI AND EDWIN H. LENNETTE (*The American Journal of Hygiene*, July, 1944) have studied the

propagation of yellow fever virus in tissue cultures containing the maximum concentrations of sulphonamide drugs. No evidence was obtained that either sulphapyridine or sulphathiazole interfered with the propagation of the virus, or with its infectivity for mice. The authors then studied the effect of the drugs administered orally or parenterally to experimentally infected mice and could demonstrate no prophylactic or therapeutic effect, nor did sulphapyridine when introduced into the allantoic cavity have any influence on the chick embryo.

Puerperal Infection due to Haemolytic Streptococcus Group A (Type 14).

W. M. McCURE (*Canadian Journal of Public Health*, October, 1944) reports that the maternity unit of a general hospital in Ontario during the period January to June 15, 1944, cared for 506 obstetric patients and 40.6% developed fever—a temperature of 100.4° F. for two consecutive days. The temperatures usually rose on the third or fourth day after delivery, and in spite of sulphonamide drugs, 16.5% had fever for over six days. From 26 perineal pads out of 38 *Streptococcus haemolyticus* A was isolated and type 14 from 20 patients with fever. One nurse and one maid had type 14 streptococcus in the throat. The autoclave was inadequate, dry sweeping was in use, the labour room was crowded and patients came into the ward in their street clothes. No isolation of any kind was practised. The hospital was short-staffed. Nurses did not wear masks and facilities for hand-washing were poor. Severe symptoms were avoided by the use of sulphonamide drugs and two patients needed penicillin.

Antigenic Properties of Staphylococcus Enterotoxin.

C. E. DOLMAN (*Canadian Journal of Public Health*, September, 1944) states that staphylococci are recognized in North America as causing a common form of food poisoning. The author divides the toxin into α and β , the latter being the enterotoxin. When 0.5% formalin was added to filtrates from a strain grown in carbon dioxide, or more simply when an agar culture was grown at 20° C. for three and a half days, the α strain was eliminated. Both cats and human subjects were used, formalinized filtrates being kept for the latter. Repeated oral doses failed to give immunity. After subcutaneous injection four or five times in twelve to nineteen days, five or more times the amount of enterotoxin which had evoked previously marked reactions was taken orally without the production of symptoms. Experiments on cats confirmed this. Given intravenous injections, they withstood many times the initial dose. Enterotoxin is antigenic.

Some Factors Affecting the Early Diagnosis of Pulmonary Tuberculosis.

B. F. MATTISON (*American Journal of Public Health*, November, 1944) has made an intensive study of 230 patients with tuberculosis and reports that 40% had known of their disease for many months before seeing a doctor. Delay was more marked in the case of men.

Minimal infections were more often seen in females and in urban patients. Known contact with a tuberculosis patient was noted in 60%. Household contact occurred in the case of 55% of rural and only 30% of city dwellers. The 70% of urban patients who had no known household contact would not have been helped by examination of house contacts of known sufferers. Among patients with insidious onset, even those who saw a doctor early benefited little. Mass X-ray examination is needed if the number of advanced infections at the first examination is to be lessened.

Influenza in Canada during the Autumn of 1943.

JAMES W. FISHER AND PEARL SCOTT (*Canadian Journal of Public Health*, September, 1944) state that after influenza A epidemics were met with in England at two-yearly intervals from 1933 to 1941, and also in North America, the epidemic in 1943 on both sides of the Atlantic was influenza B. In both countries almost simultaneously during the following interval small circumscribed outbreaks of influenza A were noted. In the United States of America the Commission on Influenza set up observation posts in different places and isolated epidemics of influenza A were reported at ten widely separated posts. Similarly and simultaneously at Edmonton and Ontario influenza A predominated (78%) during November and December, 1943. The authors conclude that influenza virus A may appear in different parts of the world during interepidemic periods and cause small circumscribed outbreaks which have little tendency to spread. It is possible that during this period a "seeding" of the population occurs with a strain of influenza virus that remains latent. The authors suggest that subsequently some suitable provocative stimulus reawakens the virus to clinical activity. Case-to-case transmission from one or more foci fails to harmonize with the findings reported by them.

The Seasonal Patterns of Measles and Chicken-Pox.

MILDRED W. WELLS (*The American Journal of Hygiene*, November, 1944) states that the concentration of droplets and microorganisms expelled into the air is an equilibrium between those added to the atmosphere and those eliminated by ventilation. The greater number of such atmospheres that an individual shares with others, the greater is his chance of infection. It is, however, not understood why organisms thus transferred may differ so much in seasonal variation. Seasonal pattern may change with ventilation changes, for example, the period when windows are kept closed varies with climate. Concentration of susceptible subjects (young children, for example) varies year by year. Unlike the subjects of test epidemics among laboratory animals, the population is not homogeneous. Sudden seasonal changes may have disturbing effects. All these affect the threshold density of susceptibles (McKendrick), that is, the point above which epidemics spread and below which they die out. Urban and rural communities affect the seasonal pattern, as will sudden seasonal differences and epidemic years. Measles

and chicken-pox (diseases uninfluenced by control measures) and scarlet fever were chosen for study and the records were followed up over a period of twenty years. Chicken-pox, the author thinks, is quite as common as measles, though official figures are lower. Many patients do not see a doctor at all, while more infections occur in interval years than measles. The greater the number of infections that occur in a given period, the higher the proportion reported. To equalize the effect of humidity seaboard States were studied. The seasonal patterns of spread of measles and chicken-pox, though differing, were found to fit in with the idea of spread by air-borne droplet nuclei. In scarlet fever the spread is less affected by ventilation.

Intracutaneous versus Subcutaneous Typhoid Vaccination for Initial Immunization.

G. F. LUIPFOLD (*American Journal of Public Health*, November, 1944) has tested the production of protective substances against typhoid and paratyphoid A and B and H and O agglutinins and finds that the standard subcutaneous course of "T.A.B." vaccine (0.5, 1.0 and 1.0 millilitre) is more effective than one-fifth the dosage given intracutaneously. Persistence of antibodies after one year is similar. Although local and systemic reactions are more marked and frequent, lowering of protection cannot be risked. Failures are likely to increase. Intracutaneous "T.A.B." vaccination is useful in the elderly and in the allergic. No general reactions occurred after 82% of the injections given intracutaneously and after 59% of those given subcutaneously. No lymphatic involvement occurred in 61% and 49% and no more than slight local tenderness in 67% and 30%. More than twice as many patients had headache, four times as many fever, 30% more axillary swelling and three times as many marked local tenderness in the subcutaneously vaccinated group.

The Dynamics of Meningococcal Infections and the Effect of Chemotherapy.

J. J. PHAIR AND E. B. SCHOENBACH (*The American Journal of Hygiene*, November, 1944) state that an army service medical unit of 99 men was followed up, cultures for meningococci being attempted three times a week for ten weeks. The average rate of meningococci found was 40%, but at some time or other 93% of inocula were positive. No correlation could be found with meningococcal infections, other infections, respiratory infections, and climatic conditions. In all the infections the organisms were Group I, but in only 53.5% of the "subclinical infections", 40.4% being Group II and 38.4% Group IIA. Of the men, 44 gave persistent positive findings. Sulphadiazine was given in doses of two or more grains daily for three days without toxic symptoms. In the group so treated the figure dropped on the third day to 3.1% compared with 40.9% in the controls, and after 26 days this rose to 5%. While the *Neisseria* disappeared (parasitic cure) pneumococcus and β -streptococci were unaffected. Group therapy can therefore control meningoccal prevalence without picking up the infected individuals.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on August 24, 1944, at Lewisham Hospital, Lewisham. The meeting took the form of a series of clinical demonstrations by members of the honorary medical staff of the hospital.

Radiological Exhibit.

DR. D. C. TRAINOR showed a series of X-ray films.

Carcinoma of the Kidney.

The first films were from a case of carcinoma of the kidney. The patient, a male, aged thirty-two years, was first examined on account of hæmaturia following an accident at work, in which he sustained a "twist", causing pain in the right lumbar region. The urogram showed a filling defect of the right renal pelvis. The pelvis was of the bifid type. Retrograde pyelograms revealed compression and distortion of the middle calyces and hydrocalyx of the upper calyx.

A diagnosis of carcinoma of the kidney was made. Dr. Trainor said that the patient had not yet been subjected to operation.

Renal Ectopia.

Further X-ray films shown by Dr. Trainor were from a case of renal ectopia. The patient was a male, aged thirty-eight years, who had been referred for urological investigation of low back pain. Urograms showed both kidneys to be in the bony pelvis and overlying the sacrum. The ureter on the left side was about four inches long and terminated in a bifid type of pelvis with its calyces directed medially. The right ureter was about three inches in length, terminating in a similar calyx system. The disposition of the renal pelvis indicated that the ectopic kidneys were joined in a horseshoe formation. Cystoscopic examination showed the bladder to be normal and the ureteric orifices in the usual position. The indigo carmine solution excreted from each side was satisfactorily coloured.

Renal Calculus and Aneurysm of the Common Iliac Artery.

Dr. Trainor finally showed X-ray films from a male patient, aged seventy years, who had been admitted to hospital complaining of pain in the lower part of the abdomen. He had had several attacks of right renal colic. On examination, he was found to have a pulsating swelling in the lower right quadrant of the abdomen. The diagnosis of aneurysm of the iliac vessels was made clinically. Urograms showed a stone one centimetre in diameter and about 1.5 centimetres in length impacted in the upper third of the right ureter. The films also showed a rounded area of increased density about three inches in diameter corresponding with the position of the pulsating swelling. On account of recurring renal colic, a right uretero-lithotomy was performed. By extending the incision downwards it was possible to see and palpate the pulsating mass, which was the aneurysm. It appeared to be arising from the common iliac artery. In view of the patient's age and the danger of gangrene, nothing was done to the aneurysm. The operation caused him little disturbance, and his recovery was uneventful. However, the aneurysm ruptured, causing immediate death three months after operation.

A meeting of the New South Wales Branch of the British Medical Association was held on September 21, 1944, at Sydney Hospital, Sydney. The meeting took the form of a series of clinical demonstrations by members of the honorary medical staff of the hospital. Parts of this report were published in the issues of January 6 and 20, 1945.

Plastic Surgery to a Hand.

DR. ARCHIE ASPINALL showed a male patient, aged twenty-three years. On May 11, 1944, the palm of the right hand had been caught in a paper machine in Tasmania. The hand was sutured, and the patient was treated in hospital for one week and then as an out-patient for seven weeks. By August 5 the wound had completely healed. On August 19 the patient was admitted to Sydney Hospital for a plastic operation to the hand. The scar, which apparently included

the palmar aponeurosis, had contracted down, and a thin band ran to the base of each finger. The index finger and thumb could be fully extended, the middle finger was flexed to 90%, the ring finger was flexed to 45% and the little finger was flexed to 25%. Abduction of the thumb was limited. Flexion of the middle finger was limited, but the others were capable of complete flexion. Flexion and extension at the wrist and touch were unimpaired.

At operation the scar tissue was dissected out of the hand and the raw area was sprinkled with sulphanilamide powder. It was not found possible to obtain complete extension of the middle finger. A full thickness skin graft was cut from the abdomen and grafted onto the hand, and the edges were sutured with horse-hair. The palm of the hand was covered with "Vaseline" gauze and packed with sponge rubber; then the hand was thickly bandaged and enclosed in plaster of Paris to ensure immobilization. It was examined ten days later: the graft had taken, except for two spots at the base of the middle finger and near the wrist. The hand was rebandaged and not disturbed for another week; during this week the fingers were exercised freely. The middle finger remained stiff, but there was free movement in the rest of the hand. Dr. Aspinall said that the graft had taken well, and with the exception of the middle finger the result was excellent. He pointed out that if grafting was to be successful the flap should fit accurately, even pressure should be maintained and perfect asepsis should be observed.

Crushed Fingers.

Dr. Aspinall next showed a male patient, aged eighteen years. On August 8, 1944, at 1 p.m., the fingers of both his hands had been crushed in a press. On the right hand, the distal phalanx of the index finger and the middle and distal phalanges of the middle finger were crushed. On the left hand the distal phalanx of the index finger, the middle and distal phalanges of the middle finger and the distal phalanx of the ring finger were crushed. At 4.30 p.m. a conservative operation was performed. The crushed phalanges, with the exception of the index finger, were hanging by skin only and required amputation. In the case of the index finger the tissue, though grossly crushed, seemed to have a fair circulation, and so it was reconstructed, though it was expected to slough later. The wounds were dusted with sulphanilamide powder and stitched with "Nylon" and horse-hair. On August 14 the hands were dressed under anaesthesia, and on August 21 they were dressed for the second time. After the first dressing active exercises were commenced, and at the time of the patient's discharge from hospital one month later he had good movement in all fingers except the reconstructed index finger; this, however, gave promise of being a useful appendage. Dr. Aspinall stressed the necessity for early and conservative treatment. He did not consider that a "set" operation should be performed, but rather that the remaining tissues should be utilized to the full; suturing should be light.

Actinomycosis.

The next patient shown by Dr. Aspinall was a female, aged fifty-two years, who in December, 1943, had undergone appendicectomy at another hospital. A pelvic abscess followed, which was drained *per vaginam*. One month later an abscess formed in the right groin; this was opened, and it had discharged yellow pus since then. In March, 1944, the patient began to suffer from severe pain in the back; it had increased in severity. On June 25 she was admitted to hospital. She was pale and emaciated, and tenderness and guarding of the whole right side of the abdomen were present. Tenderness was elicited on pressure over the sacrum, but not over the lumbar spines. A sinus discharging pus was present in the right inguinal region. The patient had lost three stone in weight in eight months.

Despite the exhibition of sulphonamides and penicillin and frequent blood transfusions, her condition became progressively worse. X-ray examination revealed low-grade osteomyelitis of the left sacro-iliac joint, and after injection of lipiodol into the sinus an extensive system of multiple branches was shown without obvious entry into any loop of the bowel. Dr. Aspinall said that on September 13 a large fluctuating abscess appeared in the left buttock, and the pus was examined by Dr. Wilson, the house surgeon, who discovered the mycelium of actinomycosis. This had not been found on repeated examination of the sinus, which was assumed to connect with the abscess of the buttock.¹

¹ This patient later died. At the post-mortem examination pus was found extending down to the psoas muscles, with osteomyelitis of the lumbar vertebrae; no connexion with the bowel was found.

Osteomyelitis Treated with Penicillin.

Dr. Aspinall finally showed a male child, aged five years, suffering from acute osteomyelitis of the lower end of the fibula, which had been treated with penicillin. On August 7, 1944, the child had gone home from school and said that a boy had kicked him in the ankle at the morning recess; he complained of pain, which was so severe that he could not put his foot to the ground. The pain diminished with rest, but he awoke and cried at intervals through the night. On August 8, having awakened at 5 a.m. and cried continuously for several hours, he was taken to the casualty department at the hospital. No symptoms related to other systems were present. He had suffered one month earlier from impetigo, which had been completely cured.

On examination of the child the pain was localized to the anterior aspect of the ankle, which was slightly swollen. The point of maximum tenderness was over the lateral malleolus. His pulse rate was 130 per minute, and his temperature was 101° F.; later in the day it rose to 103° F. "M & B 760" was administered, two grammes at once, then 0.5 gramme every four hours. On August 9, under general anaesthesia, an incision was made over the lateral malleolus through the periosteum. No pus was found, but a swabbing yielded a pure growth of *Staphylococcus aureus* on culture. The ankle was well padded and a light plaster cast was applied. On August 10 sulphonamide therapy was discontinued. Penicillin was given, 15,000 units being administered every hour to a total of 1,000,000 units. On August 14 the patient was afebrile and looked well; but he said that his ankle was still sore. On August 18 the penicillin therapy was completed; the ankle was no longer painful. On August 19 the hemoglobin value of the blood was found to be 11.8 grammes per centum; the patient looked pale, and iron was administered. On August 23 the dressing was changed. The wound appeared clean but red, and redundant granulations were present. The wound edges were strapped together and a light plaster cast was applied. On September 4 X-ray examination revealed osteomyelitis of the lower end of the fibula. The patient remained free from pain, well and afebrile until his discharge from hospital. Dr. Aspinall said that the interesting feature was that although no pus was visible, a pure culture of *Staphylococcus aureus* was obtained and early treatment was effective.¹

MEDICO-POLITICAL.

STANDARDIZATION OF OPERATING THEATRES IN PRIVATE HOSPITALS.

The following report on the standardization of operating theatres in private hospitals is published at the request of the Medical Secretary of the New South Wales Branch of the British Medical Association.

The Council of the New South Wales Branch of the British Medical Association, having given consideration to the requirements of operating theatres in private hospitals, is of the opinion that the following minimum standards should be adopted.

1. Operating Room.

(a) Size of room. This should not be less than 15 feet by 14 feet.

(b) Floor should be of terrazzo with strips of metal between.

(c) Walls should be tiled or else painted with four coats of hard paint, the final coat being of enamel paint.

(d) Lighting. Provision should be made for both daylight and artificial lighting. The daylight should be from the southern aspect of the room. In addition there should be lighting from the roof. Artificial lighting should be by means of a scialytic type of light.

(e) Heating. This should be by hot water radiating through pipes, not by steam nor by radiators. Heating should, if possible, be concealed and under a window.

2. Equipment.

(a) Operating table. A modern approved pedestal type of table capable of having its position changed.

(b) Mobile furniture. Ample space for bottles and other equipment, and the castors of the furniture should be not less than three inches in diameter.

¹ X-ray examination on October 23, 1944, revealed no abnormality.

(c) Sterilizer. This should be outside the theatre. Sterilized instruments, materials *et cetera* should be passed through a window in the wall of the theatre if possible.

3. Water.

For usual washing purposes, tap water may be used, heated but not necessarily sterile. Water for sponges *et cetera* should be sterilized.

4. Staff.

No major operation should be performed without (a) a fully qualified sister, (b) first assistant nurse and (c) a scout nurse.

There should also be a specially trained instrument assistant.

For minor operations two nurses would be sufficient.

5. Clothing.

Sufficient sterile clothing in the way of two extra outfits should be available for visitors. No person should be allowed in the theatre unless in a sterile gown and mask.

Medical Societies.

MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held on May 10, 1944, at the Children's Hospital, Carlton, Melbourne. DR. ALAN MCCUTCHEON, the President, in the chair.

Gargoylism.

DR. L. WAIT showed a female child, aged fourteen months; she had been born at term and weighed nine pounds two ounces. There was an indefinite history of jaundice for three months after birth. The parents were healthy and there had been no other pregnancies. The child's mother stated that the child had been slow in development, but her demeanour left little to be desired; the bowels were costive and the complexion was sallow. She sat up at nine months and was now attempting to walk. She had been breast fed for nine months.

On examination, the child looked like a cretin, but of brighter countenance. The most striking abnormality was the pronounced kyphosis in the dorsi-lumbar region. The skin was sallow, the maximum head circumference was eighteen inches and the anterior fontanelle was widely open. Inspiratory stridor was present. The tongue was large, but did not protrude. The nasal bridge was depressed, and the eyes were more widely separated than usual. Some nasal discharge was noticed at times. The hair was fine and dry. The abdomen was protuberant; the liver was larger than normal, but the spleen was not palpable. No corneal opacities could be found. There was some limitation of movement of the joints of the fingers, arms and lower limbs. The Wassermann test failed to produce a reaction, and the blood cholesterol content proved to be 132 milligrammes per 100 cubic centimetres. X-ray examination revealed delay in ossification of the upper femoral epiphyses, outward curving of each tibia producing *genu varum*, and congenital kyphosis in the upper lumbar region with anterior "beaking" of the second lumbar vertebra. The radiologist, Dr. Colin Macdonald, had commented that the appearances in the films were akin to those seen in gargoylism.

Achondroplasia.

DR. J. W. GRIEVE showed a male patient, aged six weeks; he said that the child's condition bore a superficial resemblance to that of Dr. Wait's patient. The child was born of normal parents and had a healthy sister aged four years. His birth weight was seven pounds seven ounces, and his weight at the time of the meeting was seven pounds nine ounces.

On examination, he was found to have the typical achondroplastic facies, with a large head set on a short, broad neck. The fontanelles were widely open, the bridge of the nose was depressed and the eyes were bulging. The soft palate was cleft. The limbs were excessively short, especially the upper parts of the arms and the thighs. There was limitation of movements at the joints, particularly at both knee joints. The fingers were short and broad, and bilateral talipes was present. Dr. Grieve showed X-ray films demonstrating the short, thickened limb bones and the unduly large head. Delay in the appearance of the epiphyses was also present.

Lobectomy and Bronchiectasis.

Dr. J. G. WHITAKER and Dr. L. WAIT showed a girl, aged nine years, on whom Dr. Whitaker had performed lobectomy for bronchiectasis of the lower lobe of the left lung. Dr. Wait said that the child had developed a cough at the age of eighteen months and had never been really free from it since. A large quantity of sputum had been expectorated, especially over the last two years. Lassitude was a prominent symptom. Four months prior to the meeting the patient was treated for bronchopneumonia. Examination in January, 1944, revealed râles and rhonchi at the base of the left lung, and a plain X-ray film showed a triangular shadow behind the heart suggesting collapse of the lower lobe of the left lung. A bronchographic examination after the instillation of lipiodol revealed bronchiectasis and collapse of the lower lobe of the left lung. Dr. Wait said that he submitted the patient to Dr. Whitaker for surgical treatment.

Dr. Whitaker said that the patient appeared to be suitable for lobectomy. He thought that atelectasis might have existed originally. Dr. Noreen Nicholson and Dr. Elizabeth Turner carried out the preliminary measures. Artificial pneumothorax was induced by the latter on March 14, 1944, six days before the operation. Six hundred cubic centimetres of air were introduced. The actual operation took a short time and was uneventful. The incision was made between the sixth and seventh ribs. The lower lobe of the left lung was found to be deflated, but not as hepatized as was usual. It was removed without much difficulty. Dr. Reginald Webster had given the following report on microscopic examination of sections from the resected lobe:

The bronchioles show varying degrees of dilatation; in some the mucous membrane is hypertrophic, in others desquamated. It is impossible to discern the muscular and glandular elements in the bronchial walls owing to dense permeation with inflammatory cells. The section as a whole presents a picture of chronic pneumonia with formation of much granulomatous and fibrous tissue to the almost total elimination of the normal alveolar pattern.

Dr. Whitaker remarked that operation on the left side was made a little more difficult by the poor differentiation of the lung into the lobes on that side. It was too soon to discuss the question of post-operative result in this case. A tendency to scoliosis was noticed after the operation, but this was not pronounced. Dr. Whitaker said that he showed the patient to demonstrate the value of surgical measures in suitable cases, and he asked his medical colleagues to forward such patients so that operation might be considered.

Hydatid Cyst of the Lung.

Dr. Whitaker then showed a child from whom he had removed a pulmonary hydatid cyst. Dr. Whitaker reminded those present that they were indebted to Dr. J. Officer Brown for an instructive talk on hydatid disease of the lung at their last meeting. Of Dr. Brown's series of 33 cases, in only two were multiple lesions found. Dr. Whitaker had felt that expectant treatment was wise in the case of small hydatid cysts in children in whom the frequency of multiple cysts was apparently greater than in adults. Dr. Noreen Nicholson had studied the hospital records over the last ten years; she had found that in 12 of the 31 cases, the cysts were multiple. Dr. Whitaker said that this point was important in the making of a decision whether or not to operate on small hydatid cysts.

The patient shown had been subjected to operation on the advice of Dr. Brown. Dr. Brown's remarks on localization of the cyst—that the X-ray picture should be taken in the position the patient would occupy at operation—had been proved to be valuable. The X-ray film showed the cyst well delineated in what appeared to be the lower lobe. At operation the incision was therefore made over the eighth intercostal space posteriorly; but the hydatid cyst was found well out of range in the upper lobe. It was impossible to approach the cyst, and the incision had to be closed. One month later a second operation was performed, the incision being made three ribs higher up. The hydatid cyst was easily visualized and was removed without difficulty. The child was now distinguished by having two wounds instead of one.

Penicillin.

Dr. ELIZABETH K. TURNER read a paper entitled "Penicillin in Pediatrics". (This paper was published in the issue of August 26, 1944.)

Dr. REGINALD WEBSTER said that the introduction of treatment by penicillin at the hospital had involved much laboratory work in the determination of sensitivity of micro-organisms to penicillin, coagulase tests with respect to

staphylococci, and detailed blood examinations of children under treatment. In much of this work he had not been directly concerned, but he could certify to the enthusiasm and industry displayed by Dr. Turner and Miss Green in sustaining the several lines of laboratory control.

Referring to the general question of the antibacterial properties of moulds, Dr. Webster said that his interest had been excited by an oft-repeated observation that intruding moulds exerted a deleterious action on the growth of tubercle bacilli in artificial culture. He recalled a recent experience in which he had inoculated three tubes of the Petraghani medium from a specimen of appropriately treated gastric content. The three tubes were inoculated from the same centrifuged deposit; in two there was a profuse growth of *Mycobacterium tuberculosis*, but in the third, in which a mould sprouted and maintained itself near the apex of the culture slope without actually spreading very far, not a single colony of *Mycobacterium tuberculosis* appeared. As far as he could gather, antibacterial substances elaborated by *Penicillium notatum* were not effective against tubercle bacilli; but there was no doubt of the existence of moulds which strongly inhibited the growth of tubercle bacilli *in vitro*.

Dr. Webster said that he had been particularly interested in the child presented by Dr. Turner as having recovered from staphylococcal meningitis. As compared with meningococcal, pneumococcal, streptococcal and influenzal infections, purulent meningitis due to *Staphylococcus aureus* was uncommon. He had never seen such a dramatic resolution of suppuration in the cerebro-spinal fluid as occurred in this child within twenty-four hours of the institution of treatment by penicillin. Dr. Webster, in conclusion, once more expressed appreciation of the initiative displayed by Dr. Turner and Miss Green in the introduction and control of penicillin treatment at the hospital.

Dr. ROBERT SOUTHEY congratulated Dr. Turner on her presentation of the subject and on the amount of work she had put into it. It was unique in the history of the society that four children had recovered from staphylococcal and pneumococcal septicaemia. The group was of interest also from a clinical viewpoint. In the case of one child aged under two years the chief complaint was of headache. Dr. Southey said he thought that such a symptom in a very young person was significant of meningitis, if sinus infection could be eliminated. Dr. Southey said that he was impressed by the development of clinical diptheria in the boy being saturated with sulphamamide and penicillin. It was a good demonstration of the resistant powers of the diptheria bacillus to chemotherapy.

Dr. L. WAIT said that he was one of the fortunate practitioners able to obtain a supply of penicillin to treat an adult who was suffering from chronic pyemia of anaerobic streptococcal origin. Abscesses had developed over several sites. There was no response to sulphathiazole. The haemoglobin level fell considerably and two blood transfusions were necessary. Penicillin therapy was instituted before the second transfusion; over 20,000 units were given intramuscularly every three hours for two days, and then the dosage was gradually reduced. The temperature fell gradually. A large abscess cavity over the sacrum rapidly healed, and developing abscesses over the right sterno-clavicular joint and breast both quickly resolved.

Dr. ERIC PRICE said that penicillin appeared to be a drug of great potency; accounts from overseas, along with the few patients shown at the meeting and his own experiences in one instance, revealed it as a powerful weapon, particularly in osteomyelitis. There was always a tendency for a wave of relief to follow the introduction of new drugs such as penicillin. A danger existed if no pains were taken to analyse what the drug was expected to do. In osteomyelitis it was hoped to stay the action of the *Staphylococcus aureus* and prevent any future action in that particular subject. There was no doubt that the septicemic element of the disease was brought rapidly under control. The drug was always given at the stage of local abscess formation. Sequestrum formation and death of bone were present at this stage, and a rapid outpouring of purulent fluid stripped the periosteum mechanically and deprived the bone of its blood supply. There was a danger in such cases that reliance would be placed on penicillin and immobilization alone, and that the fact that properly instituted surgical measures relieved the tension at the optimum moment would be forgotten. In Dr. Price's experience, pus would "out", even after the passage of years. Dr. Price said he noticed that one of the patients shown had not been operated on. He wondered whether the child would have done better if surgical treatment as well as penicillin treatment had been

undertaken. In Dr. Price's own case the foot was opened and then penicillin treatment was begun. The small amount of discharge had occasioned surprise. The case was one of osteomyelitis of the scaphoid bone of the foot. In conclusion, Dr. Price reminded his audience that the local lesion required treatment, which might yet prove to be incision at a reasonable time.

DR. J. G. WHITAKER said that he was spurred to his feet by Dr. Price's remarks. The child who had not been operated on was under his care. The patient was extremely ill with osteomyelitis somewhere in the region of the hip. It was impossible to explore all the bones in this region. Dr. Whitaker said that in his opinion osteomyelitis in the vicinity of the hip joint, the exact location of which remained uncertain, was best treated conservatively. For this reason, he did not feel disposed to operate on the patient. Dr. Whitaker said that Dr. Price had mentioned that pus would "out"; Dr. Whitaker had seen similar lesions which had not ended in suppuration after a long time had elapsed. The subsequent course in such cases could not be forecast with any accuracy.

DR. BRUCE HALLOWS paid a tribute to the lucid description of the subject given by Dr. Turner. He was in charge of the surgical treatment of one of the patients suffering from osteomyelitis. The child was desperately ill, and a large fluctuating area was present over the proximal end of the tibia. At the operation, pus oozed from all the drill holes. Over the third metacarpal of the left hand an area of fluctuation developed. This was left alone, and from the outward appearances the lesion was subsiding. At the same time, suppuration appeared in the phalanx in line with this metacarpal; this area was incised. All three areas were then quiescent. The case was interesting, in that two lesions were submitted to surgical measures, whilst for the third conservative measures were employed. Resolution occurred in all three. Dr. Hallows said he fully realized that osteomyelitis was a grave disease, and he looked upon it as a surgical "emergency"; but that view had to be qualified by the fact that accurate localization was one of the tenets for proper management of the condition. In conclusion, Dr. Hallows remarked that the question of whether the septicæmia or the osteomyelitis was primary in these cases was still *sub judice*.

DR. RALPH ALLEN said that he was at the present time struggling with a patient requiring penicillin over a long period. The case was presumably one of septicæmia, though the causative organism was not determined. The man was aged fifty-six years. The illness had begun with a sore throat followed by rigors; investigations all gave negative results. Slight improvement set in only after the exhibition of sulphadiazine, but the rigors were not controlled. The army authorities were kind enough to supply penicillin, in spite of the difficulty in demonstrating the causative organisms. One ampoule (100,000 units) was given intravenously, and four hours later this dose was repeated. After forty-eight hours definite improvement was observed. The dose was then broken down and the intramuscular route was employed. The supply of penicillin was soon exhausted. The patient was now on his six millionth unit, but his life was still in jeopardy. No localizing signs had yet made an appearance. Albuminuria was now present, the systolic blood pressure was 96 millimetres of mercury and the diastolic pressure 70, and hiccupping was a troublesome symptom. Dr. Allen asked what course he was now to adopt. He also asked Dr. Turner whether the penicillin could be given from the flask of the intravenous therapy apparatus, as distinct from the special tube at the side.

DR. KEITH HALLAM discussed the radiological aspects of the subject. He said that one point should be a guide in the future. It could be assumed that penicillin would save life in grave staphylococcal infections of bone causing acute abscess formation with crumbling bone, acute hyperæmia and angitis. Penicillin in these cases did much good, but would it stop a chronic abscess? Once an abscess became chronic, it remained chronic, unless it was excised. Dr. Hallam said that he found, in viewing films of osteomyelitis lesions, that the following analysis was the best; if a chronic osteomyelitic abscess was found in a child, the child would have the abscess for the rest of his life; if a chronic abscess was found in an adult, to trace back to the childhood would reveal that abscesses had been present for years. Dr. Hallam said that he was reminded of a diving picture in normal sequence and in reverse; the downward dive represented the child diving into a chasm of ill health and constant pain in his lifetime. Dr. Hallam asked whether penicillin was going to prevent this; he doubted it. Penicillin attacked through the blood stream and caused the

organisms to become static; but it could not attack a walled-off abscess. Therefore Dr. Hallam viewed dubiously treatment with penicillin alone if abscess formation had occurred; but he had no doubt about the life-saving quality of penicillin in the acute stage of the disease.

Dr. Turner, in reply, said that the cost of the drug was high—approximately £25 per 1,000,000 units. On this basis, the treatment of one of the patients would cost about £90. With regard to Dr. Allen's question of the mode of administration, Dr. Turner said that there was no absolute objection to the addition of the penicillin to the flask of saline solution. However, the drug had to be administered within twenty-four hours, as it was very unstable, especially in contact with light. Moreover, it would be necessary to calculate the dilution of the drug by saline solution. With regard to the efficiency of penicillin in preventing abscess formation in bone, Dr. Turner said that it was too early to make a definite pronouncement. In America patients had been followed up for twelve months without the occurrence of further metastases or the lighting-up of the original focus.

Dr. Alan McCutcheon, from the chair, thanked Dr. Turner for her illuminating description of the new method of treatment in acute illnesses. He said that Dr. Turner was fortunate to have had the opportunity of studying and treating these patients, and the society was fortunate that such a capable person had carried out the work.

TASMANIAN ASSOCIATION OF SCIENTIFIC SOCIETIES.

THE Tasmanian Association of Scientific Societies has been established in order to promote a closer liaison between scientific societies in Tasmania and also to effect contacts between these societies and the general community. Apart from these general objects the Association will have no power to interfere with the internal affairs of the societies. A council has been elected with Dr. J. Pearson as president and Mr. L. Cerutti as honorary secretary.

Amongst the most important functions of the Association will be the arrangement of joint meetings between various societies having more or less similar interests, the arrangement of public lectures, Press notices and broadcasts.

Correspondence.

IMMUNIZATION AGAINST DIPHTHERIA AND PERTUSSIS.

SIR: In the issue of the journal just to hand, published on January 20, you published a letter from Dr. Finger, Medical Superintendent of the Infectious Diseases Hospital, Northfield.

In the course of this letter it is said with reference to pertussis immunization: "... although now a well-established practice, few local or central health authorities, except in New South Wales, have shown any interest. I venture to suggest that many do not even know of its possibilities."

I should like to point out that on the contrary the Brisbane City Council is on the point of commencing a general campaign for the free immunization of children against pertussis, and it only remains for me and my department to make the necessary departmental arrangements for this to be established.

I have also received numerous requests for information on the subject from other local authorities in Queensland. It would not, therefore, be correct to say that in this State local authorities have shown no interest.

I can agree with Dr. Finger that when reasonably informed, the public shows plenty of interest. In fact my experience here in trying to get a pertussis immunization campaign under way has been that the great difficulty to get over was not the indifference of either the public or the civic fathers, but the lack of enthusiasm in the State Government department concerned. Instead of encouraging or suggesting the move, just so much dead weight to be overcome was encountered.

One supposes that if a State medical service becomes an established fact we will experience much more of this type of inertia; in fact, one wonders whence, if there are no private enthusiasts to initiate such procedures, the necessary motivating force is to come at all.

The pertussis campaign here will probably be conducted on much the same lines as our diphtheria campaign which began in 1931. This, far from providing facilities only once a year, does so at a daily clinic conducted at the City Hall throughout the year on every day of the year with the exception of Saturdays, Sundays, public holidays and a break of eleven days at Christmas time.

In addition, throughout the school year, visits are paid to the various State and denominational schools, when not only scholars but also pre-school children in the neighbourhood receive their immunizing injections.

During the last fiscal year 59 such institutions were visited, and in all, at these institutions and at the City Hall, 7,327 children received immunization. This compares favourably with the total number of births registered for the period, namely, 8,492, a birth rate of 22.3‰. One would like each year to immunize as many or more children than are born in that year, but unless the procedure is made compulsory, it seems that there must always be a proportion of parents who, for various reasons, fail to bring their children along; and whether such a procedure should be made compulsory in a democracy is a matter for the jurists to decide. The scientific answer is obvious.

I agree with Dr. Finger that more propaganda along Hollywood lines would be useful. I have always advocated this. Be that as it may, at the present moment, and with some success, this Council makes use of the following publicity measures:

1. As soon as each child in the area reaches nine months of age, circulars advocating diphtheria immunization are posted to the parents. This is said to be a most effective measure.
2. The usual posters advocating immunization are placed in trams, crèches, kindergartens, baby clinics, and other places frequented by mothers.
3. Before immunization is carried out at the various schools and convents, each and every scholar is supplied with a form in which immunization is advocated, and they take this home to their parents.
4. About a month prior to immunization being carried out at any particular school, posters are exhibited in prominent places in the neighbourhood informing parents the time and place and the school where immunization will be carried out.
5. In this city we are fortunate in having a lay Press which is willing to cooperate in advocating the immunization of children from time to time when suitable opportunity arises, for example, when a child dies from diphtheria.

Other measures used in the past which it is hoped to revive as soon as possible are: (i) Pamphlets were posted in each rate notice. (This procedure has been discontinued owing to the paper shortage.) (ii) Advertising on the screen has been used. (iii) Wireless addresses by the medical officer have been broadcast.

It will be observed that these measures are carried out not once during but throughout the year, and though not perfect, some measure of their success is possibly reflected in the following figures:

For the year 1943 there were 7,045 cases of diphtheria notified in Australia. On a population basis the number of cases which at that rate could be expected in Brisbane was 356, whereas the actual number notified was 242—just over two-thirds of the expected number.

Yours, etc.,

L. A. McLEAN,
Medical Officer of Health.

Town Hall,
Brisbane,
January 26, 1945.

CHRONIC APPENDICITIS.

SIR: IN THE MEDICAL JOURNAL OF AUSTRALIA of December 23, Dr. A. E. Lee dealt with the history of appendicitis in Australia. We are, indeed, indebted to him for such an interesting account of this subject, but some of his conclusions are open to question.

I refer particularly to his summary dismissal of appendiceal dyspepsia "to the limbo of history where, with its relative, chronic appendicitis, may it rest in peace". Also, ending his history at 1914, he states "how amputation of the appendix was to decline, so that, in another thirty years, its performance, except in emergency surgery, is rarely undertaken". If such were the case, it would certainly subject a large number of people to prolonged ill health of varying degree and greater risk and discomfort at operation.

Apparently, to Dr. Lee, appendicitis only justifies recognition and operation in the acute dramatic phase so well known to hospital residents. General practitioners probably see far more chronic appendicitis and the occasionally present dyspepsia than do surgical specialists for the reason that, in most cases, the symptoms are vague, the patient not really sick, though definitely in a substate of health, but does not feel ill enough to consult a specialist. On starting practice in the country, I was consulted by men who, while not appearing ill, complained that they "felt rotten", "unable to do a good day's work", "off their tucker" and so on. In spite of various treatment, they refused to improve and, one by one, slipped away to other men of wider experience than I and returned minus appendix and plus good health. I gradually realized that I was up against a disease new to me and not referred to in my clinical lectures or hospital practice.

The disease appears to be a continuous absorption from a toxic focus and demonstrates itself by a variety of symptoms, each in itself comparatively trifling, but which can be assembled to make a fairly complete and suggestive picture. Certain symptoms are strongly suggestive. A digestive disturbance, with or without epigastric pain, may be one. I would especially mention a condition which, in loose phraseology, I term the "silent appendix". There is little or no abdominal discomfort, little or no local tenderness, possibly none *per rectum*, yet the patient is definitely suffering from toxic absorption. The possibility of a chronically inflamed appendix in a concealed position should be considered. I speak from personal experience.

The references in the Jackson Lecture are, with one exception, of pre-1914 vintage. Reference could be made to Rolleston's "British Encyclopedia of Medical Practice", 1936, wherein Professor Wilkie, of Edinburgh, discusses chronic appendicitis, and his opinions are similar to, though more advanced than, those of Treves in 1902 quoted and rejected by the lecturer. From a knowledge of other men's work as well as my own, I hold that the few innocent appendices removed were more than justified by the restoration to normal health and full activity of the many whose health was impaired, but who were not allowed to wait until they became "emergency operations".

Yours, etc.,

P. L. DANIEL.

Kensington,
New South Wales,
January 25, 1945.

SOCIOLOGICAL MEDICINE.

SIR: Advocates of the socialization of medicine and socialists in general appear to believe that if we allow governments to assume economic control of our lives, that they will be able by some magic to abolish poverty and thus reduce the amount of ill health in the community.

I agree with those that say that poverty is one of the causes of ill health—not the only cause, of course.

But the point is: What causes poverty? A study of economic history shows that one of the greatest, if not the greatest, single factor in the causation of undeserved poverty has been the activities of governments chiefly through the unjust and oppressive taxation measures and colossal waste of the people's wealth that they have indulged in. To extend government agencies in the manner and to the extent that our socialist friends would have done would, I believe, lead to still further poverty.

But there is another cause of poverty, and in this land and probably in other places also it is this latter cause of poverty that looms larger than the economic causes. This latter cause is human folly. We spend in Australia between £40 and £50 per year in the pleasant but demoralizing indulgence in alcohol, we spend at least £100 per year in gambling—it is probably nearer £150—and to this can be added another £10 to £15 in blowing tobacco fumes into the air and some of the products of its combustion into our systems.

It is sheer sloppy thinking to believe that by changing our economic system we will do away with human folly. Such a wished-for goal is far off and can only be obtained by a long and painful education of the public. I am quite convinced that to give people what is euphemistically called social security would lead them to further indulgence in alcohol *et cetera*, would foster the growth of irresponsibility which is already a growing characteristic of our population, would lead to an increase in tuberculosis *et cetera*, and utterly degrade our race.

I have not the slightest doubt that alcohol alone is the largest factor in adult tuberculosis.

Let us emulate the sturdy might of our forefathers who asked for no favours, who fought and conquered without social security or such nauseating nostrums.

Let us believe Benjamin Franklin, who declared, "the only way to be safe is to have no security".

Yours, etc.,

PAUL G. DANE.

111, Collins Street,
Melbourne, C.I.,
February 7, 1945.

SIR: I would like to reply to criticism of my paper on "Sociological Medicine" by Dr. Ternes and Dr. Brown.

Dr. Ternes quotes: "In families occupying four or more rooms in an English borough the death rate was 6.4 per 1,000. In families living in one room it was 39; that is, in the present state of knowledge, about six persons per 1,000 inevitably die of malignant disease, tuberculosis, diabetes, syphilis, heart disease and all other infectious and chronic diseases, and 33 per 1,000 die of poverty." He then states: "This deduction is quite illogical. . . . I would venture to suggest that if the ages in the two groups were compared there would be found a great discrepancy." But the ages of the two groups were compared, as the death rates were standardized. He proceeds: "The same argument applies to the next group. . . . Here again common sense would tell us that a large percentage of this group are pensioners or persons who from age or disease are doing part-time casual work." Then common sense would certainly err, because again the death rates were standardized.

Dr. Ternes next in three paragraphs discusses an estimate that the 10% cut in food relief in Britain caused the deaths of 30,000 people a year (but he omits the means test, which was as important as the cut, for the saving in revenue claimed for each was over £27,000,000). Now I made no mention of the figure 30,000 in my paper; but some months earlier *The Bulletin* mentioned it, and also quoted the total number of deaths for the seven years during which the economies were in force, and quoted the deaths for the year 1929, and remarked that the deaths in that boom year were higher than in any of the depression years. Dr. Ternes likewise quotes all these irrelevant figures in a form very similar to that of *The Bulletin*; is it possible that to criticize a paper read before the British Medical Association he is using an article in *The Bulletin*, which reported incorrectly what had been said at a conference of the Australian Association of Scientific Workers?

The fact that the British Medical Association does now issue statements on national nutrition validates my contention that it should have done so at a time when year after year over five million people in Britain were living on an inadequate dole.

Even after the worst of the depression had passed, Sir J. Boyd Orr found that 4,500,000 people in Britain had four shillings a week or less to spend on food. Will Dr. Ternes and Dr. Brown consider carefully what standard of nutrition can be reached on sevenpence a day?

About the choice of doctor, my exact words were: "It should be quite simple to arrange that the choice of doctor should be at least as free as it is now." In considering the present amount of free choice we must remember the vast numbers of hospital out-patients to whom it is denied. Most of these are people who should be seen by a general practitioner and under a salaried service would visit their local health centre where they could nine times out of ten see the doctor of their choice. This great mass of patients, for the first time given a choice, would much more than counterbalance the few who in a medical or surgical emergency lost it for a few hours. Also the distribution of doctors would be more even, and one could expect that a town like Portland, with a population of about 4,000, would have two, so that Dr. Ternes's patients would then have a choice which they do not now enjoy.

My paper hardly called for Dr. Ternes's final gibe that I want a socialized medicine because I favour "a complete socialistic régime" rather than "because he thinks it is the best régime so far as the interests of the patients are concerned", seeing that I finished the discussion of a salaried service by saying: "But what the form of medical service is to be should be determined by the answer to one question: what medical organization will best make easily available to every member of the community the whole resources of preventive and curative medicine?"

Surely there is nothing in my paper to justify Dr. Brown's opening sneer that "it must be beatific to have derived such

a simple formula for the solution of the world's problems", nor his comment about an "exultant reference to opinions that a social revolution is in progress"; without any emotion I was simply noting what seemed to me to be historic facts. In any case Dr. Brown should know that revolution does not necessarily mean bloodshed, and need never mean it if the dominant class would only learn in time to make the necessary concessions to progressive forces. Dr. Brown also appears to forget that Britain has had three revolutions in the last 300 years.

My reading of modern sociology is that poverty is accepted as the fundamental cause of avoidable disease, death and ignorance; this is supported by the anthropometric committee of the British Association, whose findings were that (except where the mother was at starvation level) the babies of the poor were, on the average, as good human specimens as those of the rich, but that deterioration began three weeks from birth and increased from then on.

Without any evidence Dr. Brown makes the rash statement that I "assume that all the income groups have the same or at least a similar age distribution". I did not "assume" it, but, as already stated, made certain of it by quoting standardized death rates.

I quite agree that intelligence depends on many factors: my point, supported by the investigations of psychologists, is that the intelligence of the children of the poor is, on average, as good as that of the children of the rich, but that an amount of it that no nation can afford to lose is stifled by a hostile environment, the fundamental cause of which is poverty.

The modern view of heredity and environment is that heredity simply sets the limits to physical and mental attainments, and environment determines whether those limits will be reached. This view is supported by an investigation into the history of identical twins who were separated in early life; those who fell into a hostile environment were poor specimens, physically and mentally, compared with those whom a favourable environment allowed to reach the full development permitted by their heredity.

I did not say that "the privileged classes are hostile to the education of the masses", but that "an unwilling privileged class began to teach its illiterate workers", and quoted Mr. Giddy's speech in 1807 to show their attitude, some remnants of which are still alive.

Of course, there are always some enlightened people in any privileged class, but it is a sad commentary on the effectiveness of the "privileged people who were enthusiastic about educating the masses" in Russia in 1807 that the peasants in 1917 were still 80% illiterate.

I did not state that "most criminals are made by their environment", but, "As the theory that there is a type born to crime has been discarded for the view that most criminals are made by their environment", which is simply quoting the findings of modern sociology.

I am deeply grateful for Dr. Brown's paragraph, "Thirty or more years ago, when slum dwellers were moved to a new building of flats in Glasgow, in a short time the building was beginning to be slum-like", which beautifully drives home my argument that poverty with its by-products of slums, disease, ignorance and crime, is the great social enemy, and is a vital concern of medicine.

I think that many are reluctant to believe the terrible consequences of poverty, and prefer, perhaps unconsciously, to delude themselves with believing that most of the misery due to it is really due to inherited stupidity or depravity or disease; they then tell themselves that it is quite inevitable, and they can do nothing about it.

Any honest person would abandon that view if he read a little modern sociology, say McGonigle and Kirby's "Poverty and Public Health" and Sand's "Health and Human Progress".

Yours, etc.,

E. P. DARK.

Katoomba,
New South Wales,
February 8, 1945.

PHARMACEUTICAL BENEFITS ACT, 1944.

SIR: I wish to thank Dr. Hunter for the answers he has supplied to my questions, and it is not through lack of appreciation nor in criticism of his efforts when I say that the position is still not clear.

The fundamental fact is that the act provides, free to the public, medicines based on a "National Formulary of prescriptions covering the whole range of scientific medical treatment recognized by the medical profession". Moreover,

the Minister for Health has stated that penicillin and "sulpha" drugs will be included in the formulary. There is, therefore, nothing to suggest that it will be "strictly limited", nor does it seem right to assume this without seeing it.

The crux of the whole matter seems to be that the Government will not or cannot provide free every individual prescription that every individual doctor chooses to write. The reason given is the difficulties of costing. These, apparently, would be enormous and sufficient to make the scheme unworkable. So it comes to this, that the patient cannot have everything. He either gets drugs and prescriptions covered by the formulary for nothing, or else he sacrifices these benefits and pays for everything, getting in return individual prescriptions written according to knowledge, experience, whim or fancy of his doctor. The problem is to decide which is of greater benefit. My own belief is that the formulary will be able to meet the great majority of therapeutic needs and will therefore benefit the community more than the present system.

Included in answer to question 6 is the statement: "The Federal Council's objection is based mainly on the grounds that the money to be expended in providing benefits, said to be £2,500,000, could be much better spent in other directions; for example, improvement in care and treatment of tuberculosis." The Government has a programme of social reforms, as we all know, and health services are part of it. This act is a start, and no doubt was introduced first, as the machinery for its implementation already existed, and very little change was necessary, that is, no disturbance of present establishments, no new elaborate buildings, no use of manpower *et cetera*. The act is not meant, surely, to be a substitute for the treatment of the tuberculous, but merely a forerunner. There is, moreover, nothing to suggest that introduction of this act will delay other reforms—treatment of tuberculous patients included. These other reforms, that is, hospital, child welfare, maternity services, care of tuberculous *et cetera*, will come, as will also the reform of medical services as a whole. Pharmaceutical reform would have been essential sooner or later as part of a general scheme, and it is introduced first as being the simplest.

On the question of free medicines, the interesting fact emerged that in New Zealand the consumption of drugs had increased 300%. Of even greater interest is the reason for this amazing figure. Two points arise: (a) That necessary drugs were consumed which had been unavailable previously, owing to their cost. (b) That unnecessary drugs were consumed, in which case the profession was at fault for ordering them. Moreover, it is interesting to note that there is no indication that the health of the community in New Zealand has been jeopardized.

General Summary.—The answers given, taken as a whole, are more in the nature of defence of one side of a debate rather than the presentation of facts calculated to help a decision being reached on a difficult problem, which is so obviously the forerunner of other problems of an even more difficult nature.

Some questions have been answered clearly and helpfully, but not all, and it is a pity that those asking directly for the Council's opinion on benefit or otherwise of the act to the community should have been evaded. Two examples may be mentioned.

Question 3 reads: "Non-cooperation by the profession prevents division of patients into two classes; that is, those who are entitled . . . How does this help the community?" The reply given is a complete quotation from a circular newsletter on the subject of division into two classes, which had obviously prompted the question, and ends: "The Council therefore believes it is acting in the best interests of the community in refusing cooperation." No one doubts the Council's belief, but it is not clear how they arrived at it, nor how the community benefits by it.

Question 11 reads: "Does the Council consider that the act will confer no benefits on the public and will actually cause harm? Or does it consider that the act merely does not go far enough?"

The reply was: "The Federal Council believes that the act will not materially improve the health of the community, and that, as previously stated, the money required for the furnishing of the benefits could be much better spent in other directions."

This is obviously not an answer to the questions asked. In contrast with clear and concise answers to some other questions, the generalities here can be interpreted in only one way, that is, that a direct answer would not be favourable to the side of the "debate" taken by the Council, that is, non-cooperation. One is therefore forced to the conclusion that putting everyone in the class of non-

benefactors (question 3) does not benefit the community; and that the act will confer benefit on the community and cause no actual harm (question 11). Otherwise a very definite statement would have been made and generalities dispensed with.

Conclusion.—On facts available, it seems that this act will confer great benefits on the community and is capable of covering a major part of its pharmaceutical needs. It does not seem possible that it can jeopardize the health of the community, and to say that it will put doctors in the unfair position of being influenced by the patient's financial position is to overlook that this state of affairs exists to a marked degree today, not only in the matter of medicine, but in all aspects of general medical practice. The act does not restrict prescribing—a doctor can still order what he likes; but it does make it easier for the patient in the majority of cases to get what is ordered.

Non-cooperation will present many problems. At the Federal Council meeting that decided on this policy, amidst much fighting talk, one lone voice protested and was apparently unanswered. It said:

(i) ". . . his difficulty was whether he had moral right to refuse to write the prescription on a special form. He thought he had no moral right."

(ii) ". . . again raised the question of moral justification for refusal to use the formulary in certain circumstances."

Maybe many others will feel the same, even though our legal rights are emphasized. Moral rights must take precedence over legal rights. To abstain deliberately from writing a suitable formulary prescription on the government form will be very difficult for a doctor faced with a patient in real need. Many a practitioner, surely, will be forced by his conscience and his regard for his patients and their families to use both the form and the formulary.

The problem is difficult, for, at this stage, we are faced with an act containing both good and unpleasant features. To solve our problems and arrive at correct decisions, we must study facts as we know them and information given us by those in contact with the Government. This information must be clear and concise and free from any suggestion of propaganda. Does it help to include in a circular to the profession, as the Victorian Branch has done, such material as the following: ". . . committee has met on several occasions and apparently engaged in what might be called the academic exercise of drawing up a formulary which the medical profession has no intention of using unless . . ." And to end on a lighter note, are we children that we must be warned of the "voracity of the socialistic tiger"? Maybe the introduction of a capitalistic octopus would even things up in this delightful bedtime story.

Yours, etc.,

C. H. W. LAWES,
Major, Australian Army Medical
Corps, Australian Imperial Force.

Undated.

SIR: It now appears possible that members of the medical profession will be permitted to prescribe outside the limits of the formulary now in preparation.

While this is a matter for congratulation, the victory gained is a hollow one, because it does not follow that prescriptions written in the terms of the act will be dispensed as intended.

The act directs that the pharmacist will only be paid for the cheapest quality of each ingredient, and, in the case of a proprietary preparation, for the cheapest substitute of such preparation.

As a very large proportion of the newer drugs mentioned in the "B.P." and "Addenda" are only obtainable from proprietary sources, the dangers of this form of substitution are too obvious to need elaboration.

As a matter of good faith, however, may I be permitted to state the point in order to explain why the results of such prescribing will not be always as anticipated?

Yours, etc.,

Waverley,
New South Wales,
February 17, 1945.
L. INGAMILLS, M.P.S., Ph.C.

THE ANNUAL REPORT OF THE QUEENSLAND BRANCH.

SIR: I have read the report of the annual meeting of the Queensland Branch of the British Medical Association. There are 176 members (26% of total membership) engaged on full-time duty with the services.

I am thinking back to the overcrowded meeting in the Physiology Lecture Hall, Brisbane, on the evening of September 3, 1939. Unanimously and enthusiastically was a slogan adopted for the profession in Queensland: "Equality of Sacrifice." At the same meeting the principle of compensation to those who gave up practice to serve was endorsed. In the last war those who carried on in civilian practice gained in prestige and financial stability. Nothing like that must happen this time.

How have these resolutions been applied?

1. Our Branch collects from servicemen an annual subscription of £4 as against £3 in New South Wales and £1 11s. 6d. in Victoria. An increase for medico-political purposes is forecasted.

2. The Brisbane Metropolitan Assistance Fund had few subscribers and lapsed after a short life with rapidly diminishing compensation benefits to those who abandoned practice to enlist.

3. In the face of apathy, and in some instances opposition, a few worthy colleagues established another fund after a State-wide appeal. The response was miserable (the published list of subscribers covered a few inches of space), in spite of the fact that subscriptions could be deducted from taxable income. It must be distressing to the trustees, as it is humiliating to the medical servicemen, to have to distribute the meagre "pool" through a "means test". This is charity, not compensation.

The annual report embodies yet another appeal to the 451 members in civilian practice to support this fund.

4. The presidential address admits that no assistance, financial or otherwise, is available to medical officers discharged from the services.

Queensland medical servicemen remark with bitterness that medical officers from other States receive £400 to £1,200 *per annum* as compensation. Some funds in other States are so healthy that subscriptions have been suspended.

Many of the 176 members in the services enlisted from resident posts in hospitals and have no claim for financial compensation. Simple calculation will reveal the annual subscription (tax-free) required from the 451 civilian members in order to compensate, at the rate of £400 *per annum*, those medical servicemen who abandoned practice to enlist voluntarily.

"Equality of Sacrifice", "Compensation", "Preservation of Practices", "Rehabilitation"—the medical serviceman from Queensland remembers and discusses the "Tyranny of Words".

Yours, etc.,

C. M. MCCARTHY,

Major, Australian Army Medical Corps.

February 2, 1945.

SIR: For three years (1940, 1941, 1942) the Queensland Branch charged members in the services overseas only for the cost of the journals, £1 15s. 6d.

In 1943, on account of the large percentage of members of the Branch on full-time duty with the services, the Council was reluctantly compelled to review the position, and, upon the advice of the auditors of the Branch, it was decided that the subscription for 1943 payable by all members, except junior members, on full-time duty with His Majesty's Forces should be £4 *per annum*. After journal subscriptions and Federal Council contribution have been paid, a very small margin is left for organization purposes. Comparison with other Branches must take into consideration greater membership and smaller percentage in the services.

The original British Medical Association scheme for assistance to members on service was in existence for three years from 1939 to 1942, and was organized by members in the metropolitan, Ipswich and Southport areas for the benefit of medical practitioners in private practice in those areas, the underlying principle being to provide some compensation for members proceeding on active service. In addition there were various local schemes in operation outside the metropolitan area.

On the termination of the original scheme the Queensland Medical War Benefit Fund was established and came into operation in 1943. Its purpose is to assist financially those members of the Queensland Branch engaged in naval, military or air service who apply for and can prove to the trustees their need for assistance, and also such other members as the trustees may from time to time deem worthy of assistance.

Members now in the services are receiving benefit from this fund. Its scope is State wide, and British Medical Association members who enlisted from resident posts in

hospitals are not excluded. In addition to the Queensland Medical War Benefit Fund some of the original extra-metropolitan schemes are still functioning, and there are numerous private arrangements whereby members of the Branch on service receive income from colleagues in recognition of their absence on service.

Not all of the 451 members in civilian practice are in a position to contribute to the Queensland Medical War Benefit Fund. Members who are contributing to extra-metropolitan schemes, members who are assisting colleagues privately, retired members, salaried officers, junior medical officers, are in this group which is a considerable percentage of the total.

Contributions by salaried officers are not allowable as deductions for taxation purposes. The enormous increase in taxation has compelled a number of contributors to the original scheme to withdraw their support, and no one can gain in financial stability.

The Council admits that the response to its appeal for contributions has been very disappointing, and hopes that Dr. McCarthy's letter will have the effect of increasing the number of contributors to the fund.

Yours, etc.,

N. L. SHERWOOD,

Honorary Secretary, Queensland Branch of the British Medical Association.

225, Wickham Terrace, Brisbane,

February 14, 1945.

PUBLIC HEALTH ADMINISTRATION IN WESTERN AUSTRALIA.

SIR: I have read in your issue of February 3 a letter from Dr. J. Gordon Hislop on "Public Health Administration in Western Australia", in which he, as a private practitioner, presents his opinion on two points, namely, the salary offered the Commissioner of Public Health and the necessity of the latter being the "permanent head" of the department.

In both of these matters Dr. Hislop advocates innovation and a departure from what has become established practice, not only in Western Australia, but in each of the other States of the Commonwealth.

Readers of your journal are probably aware of the title "permanent head", but are possibly unfamiliar with the functions a permanent head performs.

The responsible head of any department is the Minister, who functions subject to Cabinet. Governments, however, and ministers change at not infrequent intervals; thus continuity of administration devolves upon the permanent head, who functions not only as a constant adviser to the Minister of the day, but as someone who is able to relate past, present and future policy; he is required to have knowledge of the intricacies of public service organization and procedures; and he is responsible to the Treasury for all financial commitments.

The suggestion is that this responsibility should be carried by the medical practitioner who is Commissioner of Public Health. Since the turnover of the department in this State is nearly £1,000,000 *per annum*, it is obvious that this side of his duties would absorb a considerable proportion of his time. A man appointed for his specialist professional knowledge would thus have to spend a good deal of his time on purely business, financial and routine matters, to the detriment of the exercise of his professional knowledge and training.

Since in Queensland, New South Wales, Victoria and Tasmania the organization of public health functions is under a "permanent head" in the same way as in this State, it is difficult to see why such a system should be bad for Western Australia. If the general principle is a fault, then all the above States are equally at fault.

This common administrative principle, so universally observed in all departments—professional or otherwise—is one which has not only stood the test of time, but has recently been reaffirmed in Victoria, where within the last three years the Health Department has been reorganized under a lay permanent head.

The foregoing arguments can be convincingly concluded by the following extracts from a book written on the subject in 1932 by Sir Arthur Newsholme, for many years professional head of the English Public Health Department:

The giving of official grants of money (or spending parliamentary funds) must carry with it a corresponding control by the representatives of the taxpayers. This principle puts out of court the claim sometimes

made that the public should supply the funds for medico-hygienic work, while the medical profession or their representatives conduct it. Skilled medical work cannot be controlled by laymen, but in all business arrangements the representative lay power must be supreme. Medical arrangements in all matters which are not strictly and technically medical must conform to the business arrangements made by the financially responsible representatives of the public.

In the ordinary way of private practice the patient decides whether he will take the treatment or can afford the treatment recommended by his doctor. Newsholme points out that similarly, in public medicine, the minister and the permanent head (who, in administration, may be regarded as one unit) have to decide whether the public should accept or can afford certain treatment offered.

The second point made by Dr. Hislop is in the matter of salary. Apparently he, and the British Medical Association, feel that medical salaries may only properly be determined by medical people, such as by the National Health Council. In this particular all I wish to say is that Western Australia, which is the second smallest State, offers the third highest salary payable to a commissioner of health in Australia; that is, it offers what should be an attractive salary in relationship to other States, and having regard for its relative population.

It is difficult to understand why the journal should lend itself to special criticism of Western Australia for pursuing a policy absolutely in line with all other States.

Yours, etc.,

A. H. PANTON,
Minister of Public Health.

Department of Public Health,

Perth,

February 23, 1945.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 32, of February 15, 1945.

NAVAL FORCES OF THE COMMONWEALTH. Permanent Naval Forces of the Commonwealth (Sea-Going Forces). Emergency List.

Promotion.—Surgeon Lieutenant-Commander Brian Andrew Serjeant is promoted to the rank of Acting Surgeon Commander, dated 22nd January, 1945.

Citizen Naval Forces of the Commonwealth. Royal Australian Naval Reserve.

Promotions.—Surgeon Lieutenant-Commanders John Kempson Maddox and James Aloysius Foedus Flynn are promoted to the rank of Acting Surgeon Commander, dated 22nd January, 1945.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Gibson, Richard Maxwell, M.B., B.S., 1944 (Univ. Sydney). Royal Prince Alfred Hospital, Camperdown.
Gollan, Keith Ransome, M.B., B.S., 1944 (Univ. Sydney). "Kurrong", Pennant Hills Road, Parramatta.
Peate, Desmond Lees, M.B., B.S., 1939 (Univ. Sydney), 53A, High Street, Waratah.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Arnot, Eleanor Hattie, M.B., B.S., 1942 (Univ. Sydney), Royal Alexandra Hospital for Children, Camperdown.
Badham, Charles David, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Bentivoglio, Albert, M.B., B.S., 1939 (Univ. Sydney), 97, Norton Street, Leichhardt.

Diary for the Month.

- MAR. 6.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- MAR. 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- MAR. 7.—Western Australian Branch, B.M.A.: Council Meeting.
- MAR. 7.—Victorian Branch, B.M.A.: Branch Meeting.
- MAR. 9.—Queensland Branch, B.M.A.: Council Meeting.
- MAR. 12.—Federal Council, B.M.A. in Australia: Meeting in Melbourne.
- MAR. 13.—New South Wales Branch, B.M.A.: Ethics Committee.
- MAR. 13.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- MAR. 15.—South Australian Branch, B.M.A.: Council Meeting.
- MAR. 19.—Victorian Branch, B.M.A.: Hospital Subcommittee.
- MAR. 19.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
- MAR. 20.—Victorian Branch, B.M.A.: Organization Subcommittee.
- MAR. 20.—New South Wales Branch, B.M.A.: Council Quarterly Meeting.
- MAR. 21.—Western Australian Branch, B.M.A.: General Meeting.
- MAR. 22.—New South Wales Branch, B.M.A.: Annual Meeting.
- MAR. 23.—Queensland Branch, B.M.A.: Council Meeting.
- MAR. 27.—New South Wales Branch, B.M.A.: Council Meeting.
- MAR. 28.—Victorian Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All Public Health Department appointments.

Editorial Notices.

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